hydraulic fracturing in the news - Environmental Law Institute Holds Teleconference on Hydraulic Fracturing Science Update and Frontiers

Beth Wagner to: Brian Graves, Ken-E Johnson, Michael Bechdol, Michael Overbay, Mike Frazier, Ray Leissner, Susie McKenzie, Jessica Duggan, David Parker, Philip Turner, Rob 12/03/2012 12:09 PM

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CQ NEWS

Nov. 30, 2012 – 3:30 p.m.

House GOP Wary of HHS Role in Hydraulic Fracturing Panel

By Geof Koss, CQ Roll Call

Top House Republicans are raising concerns about the participation of the Department of Health and Human Services on a federal working group on safe natural gas production, saying the department may be biased against shale gas development.

Leaders of the House Energy and Commerce Committee say public comments by a senior HHS official and agency documents suggest “preconceived notions” may color the department’s work on the Interagency Working Group to Support Safe and Responsible Development of Unconventional Domestic Natural Gas Resources, which President Barack Obama created by executive order in April.

“Despite the significant growth of natural gas development, we are greatly concerned that the scientific objectivity of the Department of Health and Human Services is being subverted and countless jobs could be in jeopardy,” Energy and Commerce Chairman Fred Upton, R-Mich., and other subcommittee chairmen wrote Friday in a letter to HHS Secretary Kathleen Sebelius.

Specifically, the lawmakers say they are concerned about public comments by Christopher Portier, the director of HHS’s Agency for Toxic Substances and Disease Registry, “that question whether a study conducted under his leadership can be objectively and validly conducted.”

Portier, who spent more than three decades at the National Institute of Environmental Health Sciences before being named director of both the toxic substances agency and the National Center for Environmental Health in 2010, has publicly called for more research to determine possible health impacts of hydraulic fracturing.

Among his comments noted in the letter are 2011 remarks in which Portier said that shale gas development “has been a disaster in some communities.”

The lawmakers also question whether ongoing investigations by the toxic substances agency related to oil and gas activities are being conducted in accordance with federal guidelines, including peer-review requirements.

The letter notes that Portier's agency had not responded to a September request by committee staff for a briefing about issues related to its oil and gas investigations.

An HHS spokesman said the agency was reviewing the letter.

Source: CQ News
Round-the-clock coverage of news from Capitol Hill.

Scientists link Colo., Okla. temblors to drilling activities
Mike Soraghan, E&E reporter Energywire Published: Monday, December 3, 2012

Scientists are saying with increased certainty that two damaging earthquakes in 2011 -- one in Colorado, the other in Oklahoma -- were triggered by oil and gas production activities.

Studies by seismologists from the U.S. Geological Survey, the University of Oklahoma and Columbia University have found the quakes were caused by the deep underground injection of drilling waste.

The researchers are to present their findings this week at the fall meeting of the American Geophysical Union in San Francisco.

Seismologists have been suspicious from the start that the convulsions were caused by human activity, or "induced." Now, with additional study, they are asserting a connection more definitively.

USGS scientists had been equivocal about links between drilling and chronic seismic activity near Trinidad, Colo., punctuated by a magnitude-5.3 convulsion in August 2011. According to an abstract for this week's conference, they have now concluded that most, if not all, of the quakes "have been triggered by the deep injection of wastewater related to the production of natural gas from the coal-bed methane field here."

University of Oklahoma seismologist Katie Keranen reported earlier this year that there was "a compelling link" between injection and the magnitude-5.6 earthquake in November that injured at least two people and damaged up to 200 structures east of Oklahoma City. Next week, she will present the results of a study done with researchers from USGS and Columbia finding that it was "likely triggered by fluid injection."

But these findings continue to be dismissed as premature by state government scientists in Colorado and Oklahoma and all but ignored by oil and gas regulators (EnergyWire, July 25). It's a scientific debate that at times has gotten personal.

"It's still an open question," Colorado state geologist Vince Matthews said in an interview Friday. "These cowboys from USGS are sure these are induced. They're jumping to conclusions."

The findings are part of a slew of reports at the AGU meeting about the connection between drilling waste, hydraulic fracturing and earthquakes. University of Texas scientist Cliff Frolich is to present his findings that injection from Barnett Shale drilling in Texas is causing more earthquakes than previously thought (EnergyWire, Aug. 7), and researchers from Columbia's Lamont-Doherty Earth Observatory are to discuss a "swarm" of 82 earthquakes in 2011 in Youngstown, Ohio, that state officials have attributed to waste injection (EnergyWire, July 12).

The specific practice of hydraulic fracturing, as opposed to disposal of frack waste, has not been blamed for damaging earthquakes. But researchers from Oxford are to attend the meeting to discuss a magnitude-2.3 earthquake in England attributed to fracturing (EnergyWire, May 11).

'We're forced to conclude that these are induced'

Geologists have known for decades that deep injection of industrial waste can lubricate faults and unleash earthquakes. One of the most famous instances of man-made earthquakes, or "induced seismicity," occurred in the late 1960s at the Rocky Mountain Arsenal near Denver, where the Army manufactured chemical weapons.

Earlier this year, USGS scientists released a study saying that a "remarkable increase" in earthquakes in the middle of the country is "almost certainly man-made" and pointed to oil and gas-related activity as a likely culprit. Their findings, though, didn't mention the magnitude-5.3 earthquake in Colorado and specifically excluded the magnitude-5.6 rupture in Oklahoma.

But USGS, prompted by the Colorado earthquake, was re-examining the earthquakes there going back to a "swarm" in 2001. Seismologists at the agency put out a dozen new instruments and then went back into the data they had gathered in the past 10 years and said there is really no other explanation for the earthquakes there.

"They're not consistent with naturally caused earthquakes," said Arthur McGarr, chief of USGS's Branch of Earthquake Geology and Geophysics, based in Menlo Park, Calif. "We're forced to conclude that these are induced."

Matthews, Colorado's top geologist, is unconvinced. He said researchers should wait on more data being gathered by Irving, Texas-based Pioneer Natural Resources, the major driller in the area. He said the company has put 15 seismometers down holes in the area and is getting very precise readings.

"The data that industry is collecting is fascinating," Matthews said. "We've never had precision like that in Colorado before."

But Justin Rubinstein, who worked with McGarr and fellow USGS scientist Bill Ellsworth on the study, said USGS had no guarantee that it would ever be able to review the data and did not need to wait.

"We could have been waiting for nothing," he said Friday.

Waiting for more information

The Oklahoma earthquake, centered near the small city of Prague, would be the largest rupture to be linked to underground injection. But state officials have not concurred with Keranen's findings and are continuing to allow injection above the active Wilzetta Fault, which ruptured in November 2011.

"I don't see the definitive evidence," Austin Holland of the Oklahoma Geological Survey said Friday. "If we're going to claim an earthquake that caused damaged was triggered by human activity, we have to have clear scientific evidence."

The main driller in the area, Tulsa-based New Dominion LLC, says its injection could not have caused the earthquake.

"We feel very comfortable that any injection we're doing had nothing to do with the earthquake," said Jean Antonides, vice president of exploration for New Dominion.

He said the company has a wealth of data about its injection operations in the area that no researchers have asked for.

"You'd think people would ask for it," Antonides said.

Geoffrey Abers, the seismologist at Columbia's Lamont-Doherty Earth Observatory who worked with Keranen on the study, said the team would like more information. Primarily, they would like to get data

from instruments placed deep underground, but that hasn't been possible.

Their study concludes that from the timing and proximity of the quake to injection operations, it was likely triggered by injection. The researchers have a wealth of data from surface seismometers because they started placing instruments a day before the earthquake, after a convulsion that proved to be a foreshock.

"Certainly, we'd encourage people trying to understand these things and regulate this to look into monitoring these wells at depth," Abers said.

Mich. university announces 2-year fracking study
Pamela King, E&E reporter Energywire Published: Monday, December 3, 2012

Researchers at the University of Michigan are working with government regulators, energy industry heads and environmental groups to conduct a two-year study of hydraulic fracturing.

Michigan is home to the Collingwood and Antrim shales, among others, but fracturing has not taken off in Michigan to the degree it has in states like Pennsylvania, North Dakota and Texas.

"While there have been numerous scientific studies about hydraulic fracturing in the United States, none have been conducted with a focus on Michigan," John Callewaert, director of integrated assessment at UM's Graham Environmental Sustainability Institute, which is overseeing and funding the research, said in a statement.

The UM announcement came Wednesday, the same day Michigan Gov. Rick Snyder (R) released a policy blueprint calling for the state to increase its production of natural gas, which is one of the fuels drillers extract during fracturing, or fracking.

"Fracking is something that is very serious, and it needs to be done the right way," Snyder said in a statement. "Let's be at the forefront of being environmentally responsible when we look at these energy issues, and let's do this in a way where we're working together."

Environmental groups are largely opposed to fracturing, saying the process, which coaxes oil and gas out of buried shale layers via high-volume injections of chemical-laced fluids, poses a threat to air and groundwater.

UM's reports, which will be released for public comment early next year, will investigate those concerns and many others. Those reports will then be used as the basis for outlining environmental, economic, social and technological approaches to help stakeholders develop policies and practices for fracturing in Michigan.

The researchers will publish their overall findings and policy recommendations in 2014.

Stakeholders in the research effort have organized a steering committee to monitor the study's progress. The panel includes representatives from the Graham Institute, Michigan Department of Environmental Quality, Michigan Environmental Council, and Michigan Oil and Gas Association.

Some of those stakeholders are being pulled in as resources for the UM study, said Energy in Depth Field Director Erik Bauss, whom UM researchers have already called on to help facilitate a visit to a Michigan frack site.

The UM teams are also soliciting public input on their work through an online comment form on the Graham Institute website.

HYDRAULIC FRACTURING:
N.Y. 'would be crazy' to keep fracking ban -- ex-Pa. governor
Energywire Published: Monday, December 3, 2012

Former Pennsylvania Gov. Ed Rendell said his state's northern neighbor would be "crazy" to continue its ban on hydraulic fracturing.

Pennsylvania has seen a major economic boom from high-volume hydraulic fracturing for natural gas, and Rendell, a Democrat, said New York stands to lose out on similar benefits if officials pass on an opportunity to allow fracturing, or fracking, in their own state.

"New York would be crazy not to lift the moratorium" imposed by former Gov. David Paterson (D) in 2008, Rendell said. "I told Gov. [Andrew] Cuomo I would come to testify before any legislative committee. I told [Cuomo] it's a good thing to do."

The Empire State's Democratic governor this week extended by 90 days the deadline for adopting regulations on fracturing, which entails pumping water, sand and chemicals into underground shale fractures to bring oil and gas to the surface (EnergyWire, Nov. 29). Experts are still studying the controversial technique's possible impacts on public health.

To grant the extension, the New York Department of Environmental Conservation was required to issue revised proposed regulations, a move opponents of fracturing called "outrageous."

But Rendell's former environmental commissioner suggested it would be outrageous for New York to continue purchasing natural gas from other states without drilling for its own.

"I do find it stunningly hypocritical to buy gas that comes from fracking wells somewhere [else] in the U.S. and then say fracking is bad," said the former commissioner, John Hanger, who last week announced his intention to run for Pennsylvania governor (EnergyWire, Nov. 28).

He said natural gas is a cleaner choice than oil or coal.

"If you're saying no to gas, you're saying yes to more coal and oil," Hanger said.

New York's gas-rich Southern Tier, which borders Pennsylvania, is "not Park Avenue. They can use every job they can get," he said.

Cuomo's office declined to comment on Rendell's remarks. The governor has said he would like to base New York's decision on "facts and science" (Campanile/Kriss, New York Post, Nov. 30). -- PK

Oil sands activist resigns from Quebec Cabinet post
Energywire Published: Monday, December 3, 2012

An ardent critic of Alberta's oil sands industry has been forced to resign from his Quebec Cabinet position following allegations of ethical transgressions.

Daniel Breton's move from environmental activist to environment minister lasted less than two months, and his exit last week removes one of the strongest left-wing voices from the centrist Cabinet.

Media reports said Breton faced legal problems including missed rent payments, unpaid speeding tickets and a 1988 conviction on employment-insurance-related fraud charges.

Those reports came as a legislative committee was already planning to probe a more recent case in which Breton was accused of interfering with an independent agency after taking office several weeks ago.

"I am [stepping down] because I don't want to be a hindrance to [Quebec Premier Pauline Marois'] work as well as the government's," Breton said.

In his statement, Breton said his personal-finance struggles have taught him what it's like to go through hard times. He said he will return to his work in his electoral district, which has poor neighborhoods.

"Showing compassion is what I will strive to do in the next few weeks and months," he said.

Although Cabinet members entered office with promises to crack down on Canada's quickly growing oil sands industry, a number of their pledges have since been shelved, delayed or diluted.

Breton's recent attack on a proposed oil pipeline is one example. He opposed Enbridge Inc.'s plan to reverse the flow of an existing pipeline to allow western oil to travel to eastern Canada, calling the move an Albertan attack on Quebec's control over its territory.

In a public statement several hours later, Breton cooled his tone, and within days, Marois was praising the economic benefits of Alberta's oil sands at a premiers conference. The premier is working with her Albertan counterpart, Alison Redford, to create a joint working group to study the Enbridge project, which is under review by Canada's National Energy Board.

Marois on Thursday defended her decision to appoint Breton. Details about his speeding tickets and the fraud conviction came up during his background check, but Breton's rent issues came to her attention only last week.

"Who hasn't had a fine for driving too fast? Who hasn't omitted to submit a certain report?" Marois said, referring to Breton's failure to file a tax return for a year when he had no income. "I believe I did the right thing naming him -- because of his expertise."

The premier said Breton came forth with an offer to resign after she discovered his consistent failure to make his rent payments. Breton said he risked becoming a political liability, and Marois said she agreed (Canadian Press/Toronto Star, Nov. 29). -- PK

GOP Targets Fracking Health Studies

Posted: November 30, 2012 Follow Clean Energy Report

House energy committee Republicans are criticizing the Agency for Toxic Substances and Disease Registry's (ATSDR) plans to study the potential health impacts related to shale gas development, raising scientific integrity concerns and calling for heightened scientific scrutiny of ATSDR's pending studies.

They also call for the Obama administration's top health official to consider consulting with state oil and gas regulators in conducting the research.

“Despite the significant growth of natural gas development, we are greatly concerned that the scientific objectivity of the Department of Health and Human Services (HHS) is being subverted and countless jobs could be in jeopardy,” House Energy & Commerce Committee Chairman Fred Upton (R-MI), along with Chairman Emeritus Joe Barton (R-TX), and subcommittee chairmen Ed Whitfield (R-KY), Joseph Pitts (R-PA) and John Shimkus (R-IL) say in a Nov. 30 letter to HHS Secretary Kathleen Sebelius.

The letter underscores Republicans' strategy, recently referenced by the committee's counsel, of using its oversight powers to pressure the administration to refrain from taking steps that limit oil and gas development and impinge on states' long-standing oversight of drilling operations. “Our view is that the Obama administration wants to assert federal control of oil and gas,” Michael Bloomquist, general counsel for the energy committee, said during a Nov. 13 law conference.

ATSDR, which is housed under HHS as part of the Centers for Disease Control & Prevention (CDC), is developing a health database to chronicle adverse effects reported by those living in areas of high natural gas development activity. And CDC has established workgroups to study potential human health implications associated with the rapid expansion of shale gas extraction activities.

In the letter, however, lawmakers raise concerns with recent statements from ATSDR's director, Dr. Chris Portier, that the GOP says call “into question whether a study under his leadership can be objectively and validly conducted.” Among other things, Portier has allegedly said that shale gas development “has been a disaster” in some areas and that anecdotal evidence of environmentally-induced illness warrants a

“more serious and systematic approach to studying it.”

Republicans also raised concerns with his remarks made earlier this year that fracking fluid can contain “potentially hazardous chemical classes.”

Portier during an Institute of Medicine meeting in April touted a strong role for CDC in studying human health risks from shale gas drilling, saying that "CDC is America's public health agency and we've put the boots on the ground" to address those risks.

Also in the letter, lawmakers urge ATSDR to “consult with State regulatory and public health officials who have much deeper experience monitoring the effects of hydraulic fracturing than most Federal officials have,” in particular suggesting that the registry include the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission in the studies.

And lawmakers are urging Sebelius to ensure that any studies conducted by ATSDR are designated as “highly influential scientific assessments” -- a designation which implies a higher level of peer review that House Republicans have sought for a slew of EPA studies, including the agency's pending analysis of the relationship between fracking and drinking water. “Accordingly, ATSDR should formally designate these studies as such and ensure that the appropriate levels of funding, rigor, and transparency are applied to ensure the studies are properly carried out,” the letter says.

Britain denies report of big shale plans

UPI International Intelligence - Monday, December 3, 2012
Author: UPI News Service
British officials have denied a report indicating energy ministers are preparing to open 60 percent of the countryside to a shale natural gas exploration boom.

A spokesman for the Department of Energy and Climate Change issued a statement Saturday calling the report in The Independent nonsense.

It is too early to assess the potential for shale gas but the suggestion more than 60 percent of the U.K. countryside could be exploited is nonsense, the department said in statement.

The Independent's report indicated that based on DECC maps it had obtained, more than 32,000 square miles -- or 64 percent of the countryside -- could potentially be exploited for shale gas and is being considered for exploration licenses.

The newspaper said the maps included vast swathes in the South of England, the Northwest, Northeast and the Central Belt in Scotland.

There is a big difference between the amount of shale gas that might exist and what can be extracted, the agency spokesman said. We have commissioned the British Geological Survey to do an assessment of the U.K.'s shale gas resources, which will report its findings next year.

The article came as anti-shale gas protests were carried out around Britain Saturday in anticipation of a statement from Chancellor of the Exchequer George Osborne this week on the government's position regarding support for shale gas.

The government imposed a moratorium on the hydraulic fracturing drilling process used in shale gas production after energy company Cuadrilla Resources was determined to have started minor earthquakes by drilling last year in Lancashire, England.

Cuadrilla issued a report confirming it was highly probable that a 2.3-magnitude tremor and a 1.5-magnitude quake felt in near Blackpool in April and May 2011 were due to fracking at the company's shale gas wells there.

Under the process, rocks are fractured thousands of feet underground using high-pressure water, sand

and chemicals to free natural gas trapped in the formations.

The procedure has come under heavy criticism from environmentalists, who say it has the potential to pollute groundwater as well as cause earthquakes.

That moratorium will be lifted soon by British Energy Secretary Ed Davey, paving the way for Osborne to announce the creation a new Office for Shale Gas to coordinate and speed up production in a dash for gas, the newspaper said.

About 300 protesters gathered in London, laying a mock pipeline in Grosvenor Square from the Canadian High Commission to the U.S. Embassy, later marching to Parliament Square, where they erected an imitation 23-foot fracking rig, the BBC reported.

Another protest was in Somerset in southwestern England, where four shale gas exploration licenses have been granted, ITV reported.

Fracking for shale gas and coal bed methane is an uneconomical and 'eco-cidal' attempt to address Britain's critical energy needs, Vanessa Vine of the protest group Britain and Ireland Frack Free said in a statement. Landscapes would be despoiled, water courses irreparably contaminated and we would have poured countless tons of methane and CO2 into the atmosphere.

The group called on British Prime Minister David Cameron to stand by his claim of leading the 'greenest government ever' and order an immediate ban on this unintelligent and short-sighted dash for gas, investing instead in safe and truly renewable energy generation.

UND studies use of carbon dioxide for oil recovery

Associated Press State Wire: North Dakota (ND) - Sunday, December 2, 2012
GRAND FORKS, N.D. (AP) — University of North Dakota researchers are studying whether injecting carbon dioxide into oil formations can enhance the recovery of oil in the state.

John Harju, associate director for research at UND's Energy and Environmental Research Center, says if the use of carbon dioxide means just 1 percent of additional oil can be recovered, that would amount to 1.7 billion barrels of oil from North Dakota's oil fields.

Harju tells Forum Communications (http://bit.ly/11A9hyz) an additional 1 percent recovery would be worth $150 billion, assuming an average oil price of $88 a barrel.

Current estimates show that producers will be able to recover between 2 percent and 10 percent of the oil from the Bakken formation using horizontal drilling and hydraulic fracturing , which uses water, sand and chemicals to help extract oil.

State has plenty of water for fracking

Columbus Dispatch, The (OH) - Sunday, December 2, 2012
Concerns about water usage by Ohio's growing shale industry is the latest false alarm raised by oil and gas opposition groups and a viewpoint highlighted in the Tuesday Dispatch article, "Is there enough water for ' fracking ' boom?"

Ohio is blessed with ample water resources that are replenished by an average of 37 inches of precipitation a year. Water is so readily available that communities throughout the state are selling water to oil and gas producers for hydraulic fracturing , a water-intensive process used to release oil and gas trapped in tight shale formations.

As mentioned in the article, the Muskingum Watershed Conservancy District is temporarily selling 6 billion gallons of water -- enough to fracture 1,000 oil and gas wells -- from two lakes to increase capacity for winter thaw. Though the "drawdown" process would continue without buyers for the water, some groups remain unreasonably opposed to the sale, even though revenue could be reinvested into the lakes and nearby campgrounds.

It should also be noted that more oil and gas producers are beginning to recycle fracturing fluid to stimulate other wells, and that energy from shale requires far less water to produce than energy from other sources, including coal, nuclear and solar.

TOM STEWART Executive vice president Ohio Oil and Gas Association Granville

Fracking and Boulder County 's future

Daily Camera, The (Boulder, CO) - Sunday, December 2, 2012
Author: Cosima Krueger-Cunningham

The Boulder County Commissioners' year-long moratorium on the processing and approval of oil and gas fracking applications will expire on Feb. 4. In the meantime, the county has been under intense pressure from the oil and gas industry to allow fracking to go forward at a breakneck pace. Most of the regulations that the Boulder County Planning Commission, County Land Use Staff and the Boulder County Commissioners have attempted to address so far have been focused on determining set-back limits between drilling operations and inhabited dwellings such as houses, schools, hospitals, and so forth, and some modest protections for transportation infrastructure and air and water quality. In their race to try to deal with the onslaught of this toxic industry into residential neighborhoods, they have not yet had the time to focus adequately on the impacts of fracking on our local food and water supply.

The Boulder area has often been called the "epicenter" of the organic food industry. There is no denying that the area boasts a decades-long reputation for its internationally-admired lifestyles of health and sustainability (LOHAS) sector. This is a clean, job-producing, steadily-growing, indefinitely sustainable, and high-demand sector of our local and regional economy that deserves to live long and prosper. Its past, present, and (we hope) future survival, however, is under serious threat from an out-of-control oil and gas industry that has successfully exempted itself from nearly every environmental law that our Congress has ever passed.

Newcomers to the Boulder area often don't realize that the social, environmental and economic gestalt that allows the area to be so attractive to so many people in so many ways --including a fortuitous set of local conditions that allows the LOHAS/organic sector to flourish here -- did not happen by accident. Rather, this gestalt is the product of decades of citizen-led insight into -- and commitment to -- integrated regional planning which is now embodied in the Boulder Valley Comprehensive Plan. The plan has preserved a relatively large amount of agriculturally-zoned land between cities in Boulder County that is fed by an extensive ditch water irrigation system. This land and water infrastructure forms the basis for the redevelopment of a diverse, sustainable local and regional food shed that could rival the best in the world (think Tuscany). This type of continued long-term vision and investment will go a long way toward helping us to descend gracefully and resiliently -- rather than calamitously -- from peak oil and to assist other communities to do the same by following our example.

We know that sooner or later all of the fossil fuels that we now depend upon will be gone. The evidence is pouring in from "sacrifice zones" in the United States and elsewhere that fracking is a technology that cannot be regulated into even marginal levels of safety. However, absent a comprehensive, nationwide ban on fracking technology, we cannot afford to lose whatever regulatory opportunities are available to us. To do so would comprehensively destroy our collective food and water future.

How can concerned citizens take action against fracking ? The following windows of opportunity for input are currently open. Prompt action is essential.

1) The Boulder County Commissioners must extend the existing permitting moratorium on fracking and pass the most restrictive land use rules they can under existing Colorado state law in the mean time. Please encourage them do so in person at their next public hearing on Tuesday, Dec. 4 at 4 p.m. in the Boulder County Court House, third floor hearing room and/or via email to commissioners@bouldercounty.org.

2) In the upcoming Colorado legislative session there may be an opportunity to further restrict fracking operations in Boulder County and statewide. As of this writing, no specific bills have yet been drafted.

Please contact your state legislators to let them know that you expect meaningful legislative relief from fracking impacts in the 2013 legislative session.

For an excellent, concise resource on the issue of food, water and fracking , please go to: http://foodandwaterwatch.org/water/ fracking / fracking -action-center

Cosima Krueger-Cunningham is a Boulder native who hosts the Boulder County Sustainable Agriculture Forum at facebook.com/BoCoSustAgForum.

Questions raised about industry , academia relationship
Knoxville News Sentinel (TN) - Sunday, December 2, 2012
Author: Megan Boehnke, Knoxville News Sentinel
The president of the State University of New York at Buffalo shut down its Shale Resources and Society Institute two weeks ago after its research drew criticism for being biased toward the gas and oil industry.

The provost at the University of Texas-Austin is reviewing a groundwater contamination study conducted by a professor who did not disclose that he is paid by and sits on the board of a gas-producing company.

At Pennsylvania State University, a 2009 report submitted to the governor that projected drillers would leave the state if new taxes were imposed was financed by industry companies and authored by a professor with a reputation for producing studies favorable to the industry, according to a Bloomberg article in July.

The flurry of criticism of fracking research conducted at universities around the country has raised questions about the relationship between academia and the oil and gas industry.

"The problem comes when people get money from industry and when the rules are not clearly marked out. If the rules are done in the right way, industry funding is OK, and even inevitable," said Cary Nelson, an English professor at the University of Illinois and past president of the American Association of University Professors. Nelson collaborated on an AAUP report offering guidelines for the relationships between research institutions and industries.

At the University of Tennessee, where the school is floating a proposal to lease its land to a drilling company and then study the environmental impacts of the well, administrators insist they will avoid the pitfalls other schools have faced. Chancellor Larry Arrington, head of the UT Institute of Agriculture, said he's aware of the issues that have popped up in Texas and other schools, but that UT still needs an industry partner in order to make the research possible.

"We want to make sure that industry is a partner, but they're not driving the research," Arrington said. "Everything we get off of this, we want to be peer-reviewed science, just like the other science we do here in this institute. We'll hold ourselves to the highest standards here."

Faculty will continue to be required to list any conflicts of interest in their annual disclosure forms. The school also insists any contract with potential drillers will not include provisions on how or when the school publishes its research. UT is also considering a website and other mechanisms to keep the public apprised of the status of the research, said Arrington.

"When we do herbicides or killing weeds, if we partner with anybody who sells weed killer, there are questions," Arrington said. "Sometimes they may even pay for the research, and we just have to keep that at arm's length. That's just how we do business. The same will apply here."

Gas and oil isn't the first industry to create conflict by funding research through universities. The pharmaceutical industry, banking industry and agriculture are all big players when it comes to contracting with universities to conduct studies, Nelson said. The biggest offender of influencing research outcomes has historically been the tobacco industry, which conspired in the 1950s to fund studies that contradicted existing science showing links between cigarettes and cancer, he said.

"Unlike smoking – which we know causes cancer in folks, end of story – in fracking , we are both knowledgeable in some areas but also don't know the full information," Nelson said. "And that means there is a reason to do this research, but it should be as disinterested a facet as possible and not done in a compromised fashion."

If schools follow guidelines such as those laid out in the AAUP report, it will be tougher to call into question the validity of research results, Nelson said. Those guidelines include making sure all data is available publicly, that the school maintains academic freedom, and enforcing conflict-of-interest policies.

"Sunlight is a great help with all of this. If faculty members do this research and if it's funded by the company directly or indirectly, they should have to disclose in public the nature of the funding," Nelson said. "The purpose of the disclosure is just so the reader of the report knows whether he or she should be skeptical of the results, and disclosure is a good indication of when skepticism is appropriate."

Editorial: UT fracking deal has both pitfalls and potential
Knoxville News Sentinel (TN) - Sunday, December 2, 2012
Author: NEWS SENTINEL EDITORIAL BOARD, Knoxville News Sentinel
The University of Tennessee's new initiative to study the effects of hydraulic fracturing to extract natural gas from deep underground could provide valuable information on the practice, but there are perils to the environment and to UT's academic integrity.

UT officials are well aware of the potential pitfalls and say they will put protections in place to prevent the worst from happening.

UT's Institute of Agriculture is seeking an oil and gas exploration company to be a partner in research to be conducted at a university-owned forestry center in Morgan and Scott counties. Under the proposal, the company would lease drilling sites and drill the wells, while UT researchers would study the effects on air and water and plants and animals. The research would be funded by lease payments from the company and a percentage of the proceeds from natural gas sales.

Hydraulic fracturing – also known as " fracking " – has led to a natural gas boom as well as contention over its environmental costs. UT officials say the findings can help guide the development of the industry in the state and the rules that regulate it.

In hydraulic fracturing , a well is drilled into shale. A pressurized mix of water and chemicals is injected into the shale, fracturing the rock and releasing natural gas. In Tennessee, nitrogen is commonly used as the fracturing agent.

Environmentalists have long charged that the chemicals used in the process can contaminate groundwater. Disposal of the wastewater returned to the surface also is a concern.

UT's study area is divided into two tracts, one of which drains into the headwaters of the Big South Fork of the Cumberland River. The river is the centerpiece of the Big South Fork National River and Recreation Area, one of the gems of Tennessee's landscape. While the population of the mountainous area is comparatively sparse, rural residents depend on wells for drinking water.

Fracking already occurs in the mountains of Morgan and Scott counties, but care must be taken to reduce the possibility of contamination from the UT site. Of course, the research, by its nature, is not designed to prevent pollution but to study the effects should it occur.

UT also is putting its academic integrity on the line. Research into hydraulic fracturing elsewhere has been tainted by its ties to industry. The State University of New York closed its Shale Resources and Society Institute last month amid criticism that its research was biased. At the University of Texas-Austin, a professor is under investigation for failing to disclose his financial ties to a gas-producing company, and Pennsylvania State University has drawn scrutiny for preparing a pro-industry report to the governor.

UT officials say they will put safeguards in place to prevent outside influences from seeping into the

research. One is that any contracts with drillers would prevent them from influencing the studies. The results of all studies will be peer-reviewed and researchers will be required to disclose potential conflicts of interest. Insistence on adherence to ethical guidelines from the American Association of University Professors would seem an obvious requirement.

Despite these concerns, the initiative is promising. The research could lead to the use of safer materials and innovations in wastewater disposal. Armed with solid, independent data, state regulators can write common-sense rules that promote the responsible use of our state's natural resources and provide best-practices information for the industry while protecting the environment.

There are risks in launching the initiative, but there are rewards as well. If UT officials remain vigilant moving forward, the project could benefit all Tennesseans.

The history of fracking

Knoxville News Sentinel (TN) - Sunday, December 2, 2012

1860s: Liquid first used to stimulate shallow, hard rock wells in Pennsylvania, New York, Kentucky and West Virginia.

1930s: Idea of injecting a nonexplosive fluid into the ground to stimulate a well began to be attempted.

1947: Hydraulic fracturing introduced by Stanolind Oil.

1976: The Department of Energy launches the Eastern Gas Shales Project, a joint research project among state, federal and private industrial organizations to research "unconventional" natural gas resources.

1980s: Horizontal drilling first combined with hydraulic fracturing in a frack job in north Texas.

1986: As part of an early federal effort to investigate new methods of extracting natural gas, the Department of Energy sponsors the drilling of 2,000-foot horizontal well in the Devonian Shales of Wayne County, W.Va.

1998: Present-day form of hydraulic fracturing is first used in the Barnett Shale in Texas. Formerly inaccessible gas reservoirs are now open for fracking .

June 2004: EPA report says fracking fluids are toxic and that some portion of these toxic fluids remain in the ground after a frack job. However, the report concludes "injection of hydraulic fracturing fluids into coal bed methane wells poses "little or no threat" to drinking water supplies.

August 2005: Congress passes a law prohibiting the EPA from regulating fracking under the Safe Drinking Water Act. In most other cases the law dictates what chemicals can be injected underground.

June 2009: U.S. House of Representatives introduces the Fracking Responsibility and Awareness of Chemicals Act to repeal fracking 's exemption from the SDWA. The act never came to a vote.

February 2010: The House Committee on Energy and Commerce launches an investigation into the potential environmental and health impacts of fracking .

November 2011: By request of the U.S. Congress, the EPA issues a Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources, to be completed by 2014.

Source: " Hydraulic Fracturing : History of an Enduring Technology," propublica.org

Photos reveal effects of Marcellus shale drilling

Pittsburgh Tribune-Review (PA) - Sunday, December 2, 2012

Author: KURT SHAW

Featuring the work of six documentary photographers, the “Marcellus Shale Documentary Project” exhibit on display at Pittsburgh Filmmakers Galleries in Oakland peels back the layers of a complex industry that

is much talked about in our region.

Organized by photographer Brian Cohen and Pittsburgh Center for the Arts director Laura Domencic, it features more than 50 photographs that, seen together, flesh out the environmental, social and economic impact of natural-gas drilling in Pennsylvania.

Each of the six photographers — Cohen, Noah Addis, Nina Berman, Scott Goldsmith, Lynn Johnson and Martha Rial — took a different approach to the topic in different parts of the state.

For example, a photograph showing the backyards of homes next to an oil refinery in Marcus Hook, Delaware County, offers a close-up view of an industry that is literally at many people's doorsteps.

Addis, who is based in Columbus, Ohio, but took this photograph near Philadelphia, says the refinery has since been shut down, "but there is a huge industrial infrastructure left behind."

"Energy is often a boom-and-bust business, so it makes me wonder about the huge infrastructure being built up around drilling sites in the Marcellus Shale region," Addis says. "The rigs are the most obvious symbol of the drilling boom, but they're temporary. The wells themselves, however, as well as the miles of pipelines, pumping and compressor stations and other facilities will remain long after the initial drilling boom is over. I wonder what will happen to that huge infrastructure once the wells have stopped producing gas?"

Addis says there has been talk of reusing the Marcus Hook refinery as a liquefied natural-gas export facility that could be used to ship Marcellus gas overseas.
"It's just interesting because one of the big selling points of drilling in the Marcellus Shale was that it would help the U.S. become more energy independent," he says. "But really, energy is a global marketplace and, of course, the gas will eventually be sold where it can make the most profit."

As for his part, Cohen's landscape photographs, made principally in Westmoreland, Somerset and Butler counties, consider the Pennsylvania landscape in the context of the advent of gas drilling. Looking much like picture postcards, they are punctuated with drilling sites that look clean and decent enough but include label copy that belies their otherwise bucolic views.

For example, one reads: "The Millers leased their land for gas drilling and have made enough from the deal to enable them to keep their Meadow Creek Farm running. They report no ill effects from the drilling at the time of writing; however, relations with their neighbors have deteriorated significantly. The lease was recently purchased by Chevron. 05/30/2012."

Goldsmith's shot of a gas-drilling well in Hopewell Township, Washington County, registers closer to home, showing smaller "gentlemen's farms" surrounding a drilling rig. Neighbors nearby have complained of dust, noise and "seismic activity" as a result of the drilling.

Another shot by Goldsmith shows a teary-eyed John "Denny" Fair inside his small home, taken after workers hauled away two water tanks that supplied three homes from his backyard. The label copy reads: "When Fair reconnected his water well, it pumped out orange-brown water that he and the neighbors don't want to use. Fair said the water turned brown and 'stinky' shortly after fracking started."

Personal perspectives like this abound in this exhibit. For example, in another shot by Berman, a Bradford County couple, Jodie Simons and Jason Lamphere, are seen giving their horses bottled water to drink. Having no clean well water, the couple "claim their water was contaminated by nearby gas-drilling activities causing their daughter to be sick and their animals to die," according to the accompanying label.

Other works, like Johnson's "Lobbyist and activist — on the sidelines at a protest in Harrisburg, PA" showcase a more-active role citizens have been taking in protesting against fracking in general.

Addis says that he, like all the photographers, was "very excited to be asked to participate" in the Marcellus Shale Documentary Project.

“It’s a very important issue, and I think there is a lack of real information about what is actually going on,” he says. “In Philadelphia, where I lived at the time, we heard a lot of shouting from activists on both sides of the story, but I’ve seen very little honest, nuanced coverage.

“I personally approached this project without any kind of agenda, I just wanted to take a straightforward look to see how the landscape has been changed by the drilling boom and how people have been affected.”

Kurt Shaw is the art critic for Trib Total Media. He can be reached at kshaw@tribweb.com.

Boro pol lauds Cuomo for fracking leadership

TimesLedger Newspapers (Queens, NY) - Sunday, December 2, 2012
Author: Karen Frantz, TimesLedger Newspapers
As Gov. Andrew Cuomo wrestles with whether or not to allow hydraulic fracturing in the state, a Queens councilman has lauded him for refusing to buckle to pressure and allowing a critical deadline to pass rather than speed up a review of the controversial drilling method’s potential impact on public health.City Councilman James Gennaro (D-Fresh Meadows), chairman of the Council’s Environmental Protection Committee, said Cuomo had made it clear from his public statements that his decision on hydraulic fracturing would be guided by science and safety.

“He has lived up to his word and not succumbed to political pressure and artificial timetables,” Gennaro said in a statement. “I applaud him for that.”

He added that Cuomo is attempting to do something that has not been done before in states that allow hydrofracking , which is to regulate the practice so gas companies bear the full cost of production while ensuring that drilling is not subsidized by the degradation of water, air and land resources.

“Such resources, of course, belong to the current and future generations of New Yorkers and do not exist merely to increase the gas companies’ bottom line,” Gennaro said.

Hydrofracking is the process of extracting natural gas from shale by blasting a mix of water and chemicals into the ground. There has been a moratorium on the practice in the state since 2008 while the state Department of Environmental Conservation has been drafting new regulations and conducting an environmental impact study.

Opponents of hydrofracking argue it could potentially contaminate the city’s drinking water, but supporters contend it would create jobs and help boost New York’s economy.

Cuomo said at a news conference at the Javits Center in New York City last week that a Nov. 29 deadline for completing a state Health Department review of hydrofracking could not realistically be met. The blown deadline means a rule-making process, which includes a round of public comments on the DEC draft regulations, will effectively start over again.

Thus, new hydrofracking regulations may not be finalized for six months or more.

But Cuomo said the Health Department was simply not ready to release its findings.

“This is a big decision for the state,” Cuomo said. “It has potential economic benefits if the state goes forward with fracking . But we want to make sure that it’s safe and we want to make sure the environment is protected and people are protected and that’s why we’re doing a health assessment.”

Reach reporter Karen Frantz by e-mail at kfrantz@cnglocal.com or by phone at 718-260-4538.
Caption: Protesters rally against hydrofracking as the legislative session winds down in Albany earlier this year.

Mills: Beware 'safe and responsible' plan to develop gas resources

Wichita Falls Times Record News (TX) - Sunday, December 2, 2012
Author: Alex Mills, Times Record News
Regulation of the oil and gas industry by state and federal agencies has been extensive for many years, but regulation has reached a new high during the past three years.

The federal government has led the way recently with more than a dozen agencies exerting some control or influence on the oil and gas business.

The actions started by the federal agencies, especially the Environmental Protection Agency, have filtered down to the Texas Commission on Environmental Quality and the Texas Railroad Commission.

President Barack Obama's team made it clear before the election that their opponents would have to pay a big price if Obama won re-election.

"After we win this election, it's our turn. Payback time. Everyone not with us is against us and they better be ready because we don't forget," Valerie Jarrett, assistant to the president for Intergovernmental Affairs and Public Engagement, said on Nov. 5, one day before the election.

Obama has established an interagency working group of 13 federal agencies to coordinate and oversee the "safe and responsible development of unconventional domestic natural gas resources."

Yes, 13 federal agencies — the departments of Defense, Interior, Agriculture, Commerce, Health and Human Services, Transportation, Energy, Homeland Security, the EPA, the Council on Environmental Quality, the Office of Science and Technology Policy, the Office of Management and Budget, the National Economic Council and "such other agencies or offices as the Chair may invite to participate" — will compose the "Working Group" that will be responsible for long-term planning, among other thing.

Honestly, does anyone believe that 13 federal agencies will be able to establish a long-term plan for the "safe and responsible development of unconventional domestic natural gas resources."

The phrase "safe and responsible" could mean just about anything, including a hidden agenda to regulate hydraulic fracturing on the federal level.

Even though state regulatory agencies have effectively regulated the oil and gas industry and fracturing for more than 50 years, these federal agencies continue to expand their influence in what has been termed "regulatory overreach."

For example, EPA released new regulations of air emissions, water usage and hydraulic fracturing .

In an effort to defend the state's regulatory authority, Texas enacted a law that requires the disclosure of chemicals used in hydraulic fracturing . Also, the Texas Commission on Environmental Quality issued regulations requiring the disclosure of equipment used in the production of natural gas in the Barnett Shale, and it adopted new reporting guidelines for air emissions.

The Railroad Commission issued new proposed regulations on drilling and completion, and now it looks like it is going to implement a new enforcement division with increased fines and penalties for companies that violate RRC rules.

The list doesn't stop here. It goes on and on to cover water disposal in injection wells, flaring of gas, and just about every activity regulated by the RRC in more than 100 rules.
Caption: Oil Pump

Producers of natural gas turn to 'green completion'

Athens Banner-Herald (GA) - Saturday, December 1, 2012
Author: Andrew Maykuth, The Philadelphia Inquirer –
SYCAMORE, Pa. — The towering flares that turn night into day in the Marcellus Shale gaslands are becoming an increasingly rare sight.

Natural gas producers are turning to new techniques to capture the gas emitted during the well-completion process. In the past, a well's initial production was typically vented or burned off to allow impurities to clear before the well was tied into a pipeline.

Now, more operators are employing reduced-emission completions — a "green completion" — a process in which impurities such as sand, drilling debris, and fluids from hydraulic fracturing are filtered out and the gas is sold, not wasted.

The five gas wells that EQT Corp. completed in October at this remote site in Washington Township, Pa., are typical. Compared to a gas flare, which roars like a jet engine and licks the sky with flame like a giant welder's torch, green completion is dull and quiet.

EQT is not the only drilling company that has embraced green completions. The equipment for separating the gas from the "flowback" has been perfected in the past decade, and in the next three years, using it will become standard practice across the nation.

The U.S. Environmental Protection Agency approved new rules this year requiring green completions nationwide by 2015, except for exploratory wells unconnected to pipelines. As of Oct. 15, drillers can no longer vent the gas into the atmosphere without burning.

The EPA says green completions will save drillers up to $19 million a year by capturing natural gas that would be wasted.

The advent of green completions is an example of the rapid development of shale-gas technology, which has revived a flagging domestic energy sector in just a few years.

"What was true yesterday is no longer true today," said Andrew Place, director of public policy research at EQT, based in Pittsburgh. "Systems are evolving."

Much of the new technology has been driven to address fears about drilling, including hydraulic fracturing , the extraction technique that has turned impermeable shale into a bonanza of oil and gas.

"Public concerns have pushed the engineers to come up with solutions," Place said.

Activists and regulators are paying more attention to air emissions from shale-gas development, including toxins emitted during drilling and production. Much of the focus has been on releases of methane, the main component of natural gas as well as a potent greenhouse gas, though there is substantial disagreement over studies attempting to measure the methane leaks.

In devising the new rules, the EPA said it was acting under its Clean Air Act mandate to reduce emissions of volatile organic compounds and pollutants such as benzene, which can cause cancer. The agency said the new rules were expected to eliminate 95 percent of the smog-forming volatile organic compounds emitted from more than 13,000 new gas wells each year.

The EPA said a "co-benefit" of green completions was a reduction in methane emissions by 1 million to 1.7 million tons a year.

The government delayed full implementation of the rule until 2015 to allow the industry to build enough equipment to handle the workload.

"We'd say the rules have not gone far enough," said Jay Duffy, a staff attorney with Philadelphia's Clean Air Council, which joined with Earthjustice in October to notify the EPA it planned to sue.

Duffy praised the EPA for taking action to curb toxic emissions from drilling, but he contends the federal agency failed to directly confront the climate-change issue. The EPA concluded in 2009 that greenhouse gases endangered public health and welfare, but it has not devised standards on methane emissions.

Anti-drilling activists argue that so much methane escapes from gas development it undermines the industry's claims about the clean-air benefits of the shale-gas boom.

Some industry leaders say the biggest benefit to green-completion technology is that they hope it puts the emissions controversy to rest. "I do think it addresses a criticism that the industry has had in terms of methane emissions, and maybe we can take that off the table," Jack P. Williams Jr., president of XTO Energy, said in a recent interview.

Attend this conference to learn more about issue of fracking

Cumberland Times-News, The (MD) - Saturday, December 1, 2012
Author: To The Editor:, Cumberland Times-News
On Dec. 8, there will be a conference called Drilling Down at the University of Baltimore.

The conference will focus on hydraulic fracturing , commonly referred to as fracking , its risks and how Maryland should proceed as far as the safety of the public and environment are concerned.

Hundreds of Maryland citizens and legislatures will be present, including several speakers such as Lester Brown, Maryland Delegate Heather Mizeur and climate change blogger Joe Romm.

This will be a great opportunity to learn more about this issue, meet other activists working on it and learn what the individual can do to help.

Fracking will be a major issue in the coming year, and more and more citizens are coming forth with their concerns and support for a legislative moratorium on fracking in Maryland until studies prove that it won't harm the public or the environment.

This dangerous practice has been linked to water contamination, air pollution and a number of other negative side effects so must we take care to protect our natural resources.

Carpooling can be coordinated. For more information please contact me at desbullard@yahoo.com.

Desiree Bullard Cumberland

ALEX MILLS: Federal, state regulations for oil and gas reaching new levels

San Angelo Standard-Times (TX) - Saturday, December 1, 2012
Author: Alex Mills, San Angelo Standard Times
Regulation of the oil and gas industry by state and federal agencies has been extensive for many years, but regulation has reached a new high during the last three years.

The federal government has led the way recently with more than a dozen agencies exerting some control or influence on the oil and gas business.

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Alex Mills is president of the Texas Alliance of Energy Producers. Contact him at alexm@texasalliance.org.

News In Brief
Observer-Dispatch (Utica, NY) - Friday, November 30, 2012
New fracking rules released by DEC .

New York environmental officials released a revised set of proposed regulations for hydraulic fracturing natural gas and will begin taking public comment on them in December.

The Department of Environmental Conservation says the voluminous technical document was initially posted Wednesday, a day before a deadline for adopting rules for the controversial drilling known as " fracking " or making changes and allowing more comment. It's been a year since the last public hearings on the original proposal.

New York has not yet approved the technology. The agency said Thursday the changes allow it to extend the review process and take into account a pending analysis by the state health department. Driller sues town/14A.

4 arrested at NYC sex assault trial.

Four men were arrested on charges they photographed a 17-year-old girl testifying in a sexual abuse trial against a religious counselor.

The men were at the Brooklyn trial of Nechemya Weberman on Thursday. Weberman has pleaded not guilty to charges he abused the girl for years when he was supposed to be counseling her. Both belong to

an ultra-orthodox Jewish sect.

The girl was on the witness stand when the men, supporters of Weberman, snapped images. One was posted on Twitter, though the girl's name was not included.

Court officers confiscated the cell phones. It's illegal to photograph in courtrooms without a court order. The men face contempt charges.

Before the trial, other men were charged with trying to bribe the girl so she would drop charges.

Caviar distributor guilty of scam.

A New York distributor who evaded arrest for nearly a quarter century pleaded guilty Thursday to unlawfully importing more than 100, 000 pounds of Russian and Iranian caviar in the 1980s.

Isidoro "Mario" Garbarino faces up to four years in prison at a Jan. 7 sentencing after admitting that he used schemes to avoid high taxes.

Experts' review of NY fracking soon to be complete
Associated Press State Wire: New York (NY) - Saturday, December 1, 2012
Author: MARY ESCH Associated Press
ALBANY, N.Y. (AP) — Experts reviewing the health effects of shale gas development in New York are among the nation's most prominent in environmental health, giving opponents hope but the industry concern that reviewers will warn against drilling operations that use hydraulic fracturing .

The state has had a moratorium on " fracking " for shale gas since the Department of Environmental Conservation started an environmental impact study in 2008. The department released proposed new regulations Wednesday stemming from the study and will take public comment before making them final.

The health review is expected to be completed by Monday.

At least one of the health experts said that while she's aware some things have gone wrong in communities with shale gas drilling, the health and environmental damage from using gas for heat and fuel may not be as bad as burning coal.

"We know that emissions from burning coal cause tremendous damage to health," Lynn Goldman of George Washington University said in an interview with The Associated Press. "A decision not to frack is a decision to use more coal."

Health professionals and environmental groups in New York called on the Cuomo administration to do a comprehensive health impact study. But DEC Commissioner Joe Martens decided instead to have the state health department and outside experts review the analysis done by the Department of Environmental Conservation in coming up with the new rules.

State Health Commissioner Nirav Shah chose Goldman, Richard Jackson and John Adgate to conduct the review. Goldman is dean of George Washington University's School of Public Health and Health Services. Jackson is chairman of the Department of Environmental Health Sciences at the University of California Los Angeles School of Public Health. Adgate chairs the Department of Environmental and Occupational Health at the University of Colorado School of Public Health.

All three experts raised red flags for the industry group Energy In Depth. The group sent a letter to Shah saying previous work and statements by them showed anti- fracking bias.

"While voicing concerns is an understandable and at times necessary function of scientific progress, these experts have chosen to make statements that contradict well established scientific conclusions about both hydraulic fracturing and shale development," Energy In Depth Executive Director Lee Fuller wrote.

In fracking , millions of gallons of chemically treated water is injected into wells to break up the underground shale and release the gas. Regulators and the industry say the method is safe when done according to rules set by the states. But environmental groups and some scientists say not enough research has been done on air and water contamination or other health and environmental issues.

Goldman, who also is an Environmental Defense Fund trustee, said she brings no bias to the review of New York's health assessment. The fund is helping develop state and national standards to ensure that natural gas is produced in a way that safeguards public health and the environment.

Goldman also was assistant administrator for the Environmental Protection Agency's Office of Prevention, Pesticides and Toxic Substances, under President Bill Clinton. During her time there, the EPA strengthened a right-to-know provision under the Toxics Release Inventory and overhauled the nation's pesticides laws.

"What I think this exercise is about is can New York do this in a way that is safe – understanding that safety has to be in the context of 'in comparison to what?'" Goldman said. "We're continuing to demand a lot of energy in our economy. There's no such thing as an absolutely safe way of generating energy at this point."

Jackson and Adgate declined to be interviewed for this story, referring inquiries to New York's Health Department. The department declined to discuss the review.

Jackson is best known as an expert on the links between community design and public health. He produced a four-part documentary series called "Designing Healthy Communities" that aired on PBS last year. It explored the connection between reliance on car transportation to the rise in obesity, diabetes and heart disease.

Energy In Depth takes exception to a statement from Jackson on his university department's website, where he mentions fracking in a welcome message to students.

"These most unregulated drilling processes numbering in the hundreds of thousands have impacts on air quality including global warming, drinking water and other waters, soils, air quality, and nearby populations including by noise," Jackson said on the site. " Fracking involves serious worker exposures and will likely cause silicosis and other lethal diseases."

Adgate was a senior investigator for the nation's first comprehensive health impact assessment for hydraulic fracturing , for the Colorado town of Battlement Mesa. The study identified health threats and offered ways of minimizing them. County officials ended the assessment before it was completed, saying it had become bogged down in an endless stream of commentary and objections.

The Cuomo administration has refused media and public requests to make the DEC health review public, prompting criticism from environmental groups.

"This is no time for secrecy," Dr. Philip Landrigan, director of the Children's Environmental Health Center at Mount Sinai School of Medicine, said in a statement. "Members of New York's medical community must have access to the documents that are now under review by the team of outside reviewers."

Fracking affects the food you eat (Video)

Atlanta Examiner (GA) - Saturday, December 1, 2012

The concept of fracking , drilling miles into the earth's surface and breaking it open with water that contains chemicals, has never been impressive as a means to find pockets of fuel. If it occurs to the average person that fracking is another tool that is destroying the earth and everything on it, shouldn't it have occurred to those who invented it?

Fracking is mainly done in areas where there are large farms and ranches. It just happens to be where huge underground resources of fossil fuels are located. Using the power of water, with added chemicals,

the earth is fractured or fracked, releasing the natural sources of fuel. This may solve one problem, but how many problems does it cause?

Livestock are dying in areas where fracking is taking place. Many animals that are sick are making their way into the food chain. What chemicals are being released into the air and into our water supply? What are the long-term consequences of consuming food animals that have been poisoned through the fracking process? According to an article by the Food & Environmental Reporting Network, it requires up to "... 7 million gallons of water, plus an additional 400,000 gallons of additives..."to drill and frack one well.

The additives consist of a cocktail that would have paint huffers and meth addicts singing and performing a happy dance. This cocktail of chemicals is showing up in the dairy milk we feed our families, in breast milk new mothers feed their infants and in plants and food animals that grace the dinner tables across America. And we wonder why the numbers of autism, ADD, ADHD and other learning problems have sky-rocketed in recent years.

The federal government is doing nothing to insure the safety of our foods. They aren't even planning any studies. What should people do to be reasonably sure they are eating wholesome, healthy foods?

* Grow your own organic vegetables.
* Ask your grocer/butcher where the meat comes from.
* Buy locally farmed and ranched foods.
* Buy dairy from local farmers when possible.
* Learn where fracking is being practiced and avoid foods from those areas.
* Call or write senators and representatives to voice concerns about fracking and food supplies. Ask for studies to be done and mandatory testing for fracking chemicals.

It is becoming increasingly more difficult to avoid harmful foods in the diet. This means that every shopping trip will take longer as you ask questions and read labels. It may not be a welcome prospect, but the consequences of ignoring what little information we do have could mean irreparable damage to your child's mind and physical health, as well as your own.

Republicans tell Sebelius to exercise caution on fracking study

Denver Examiner (CO) - Saturday, December 1, 2012
A group of key GOP Congressmen on the House Energy Committee told Health and Human Services Secretary Kathleen Sebelius to use extreme caution in a study of the health effects of hydraulic fracturing or “ fracking .” The Congressmen said that if the future study linked fracking with drinking water contamination it would kill jobs and hurt the economy.

What they know that we don’t know?

The lawmakers sent a letter to Sebelius Friday stating that such a study could stymie job growth if not “properly executed.” They expressed concern in the letter that naturally occurring substances in groundwater could be improperly labeled as contaminants.

House Energy and Commerce Committee Chairman Fred Upton (R-MI.) sent the letter. Other signatories included Rep. Ed Whitfield (R-KY), the committee’s Energy and Power subcommittee chairman; Rep. Joe Pitts (R-PA), the committee’s Health subcommittee chairman; Rep. John Shimkus R-IL), the committee’s Environment and the Economy subcommittee chairman; and past committee chairman Rep. Joe Barton (R-TX).

The Centers for Disease Control and Prevention is considering examining a potential link between hydraulic fracturing , or fracking , and drinking water contamination. That agency is under the umbrella of the Department Ms Sebelius heads.

What the lawmakers were saying is that the proposed study by the CDC in Atlanta will be “cooked” to make it look like fracking pollutes drinking water. They say if that leaks out, it would kill jobs and damage

the economy.

“Despite the significant growth of natural gas development, we are greatly concerned that the scientific objectivity of the Department of Health and Human Services is being subverted and countless jobs could be in jeopardy,” the lawmakers said in their letter. In other words, they are accusing her of skewing a study that has not yet been undertaken.

Environmentalists have been saying that fracking contaminates drinking water for years. As a result, the Environmental Protection Agency is conducting a national study on fracking ’s effects on drinking water. A progress report on that study is expected by the end of the year

But industry, along with lawmakers from both sides of the aisle, says the practice is safe. They contend state regulators have ably handled fracking oversight, and that connections between fracking and groundwater contamination are faulty.

It is true that because of fracking , the U.S. is poised to become the world’s largest gas and oil producer in the next few years surpassing Saudi Arabia. Fracking is causing many communities to boom.

It is not just environmentalists and liberal Democrats who are concerned about the effects of fracking on water. Many local officials of both parties have expressed concerns about polluted drinking water and tap water that ignites in the sink.

While the EPA study is likely to determine whether contaminated water comes from fracking operations, the CDC study, if undertaken, would assess the health risks associated with that contamination. Just because there are agents in the water, naturally occurring or not, does not mean they are harmful to humans in small amounts. However, they could be very harmful if the concentrations are high enough.

Many a pioneer died drinking alkali water in the desert that naturally occurring. On the other hand, man should not deliberately pollute drinking water with substances that we know are harmful. Those deaths are preventable.

It seems like these Republicans must know something we don’t. They must believe that the study will determine that fracking is polluting our water and they want to kill it before the results are discovered. If not, why are they sounding an alarm before the study is conducted?

Instead of coming down on the side of people who must drink contaminated water including children, these Congressmen are coming down on the side of the gas companies and their profits. I wonder if campaign contributions, lavish lunches and dinners, vacations and golf outings have anything to do with it.

Let’s hope the CDC will find out for sure how safe the water is that we drink.

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Tracking Bakken oil movement : 40 percent of SW North Dakota crude leaves via railway
Dickinson Press (ND) - Saturday, December 1, 2012
Author: Bryan Horwath, The Dickinson Press, N.D.
Dec. 01--WHILE SOME IN DICKINSON -- particularly on the south side of town -- might only notice a passing train when it's holding up traffic at a crossing or when its horn is alerting motorists and pedestrians, the railroad is actually a key logistic component of the Bakken oil play.

Because of the lack of pipeline alternatives to move oil to refineries, when the North Dakota Oil Patch began to explode a few years ago, energy companies turned to moving much of their crude by railway. One of the largest railroad transportation companies in the U.S., BNSF Railway has stepped to the plate as the Oil Patch has played a key role in the country's push toward energy independence.

"Historically, oil and gas producers have used pipelines to transport crude from production to refineries,"

said BNSF Executive Vice President and Chief Marketing Officer John Lanigan. "Because this shale development growth came about so quickly, there has been a shortage of pipeline capacity to coastal refineries. BNSF has responded quickly to enable producers to move crude to the most attractive markets."

Like nearly every other service provider in and around the Oil Patch, BNSF has been busy -- very busy.

"BNSF has been hauling Bakken crude out of the Williston Basin area for over five years," BNSF executive Dave Garin said earlier this year. "In that time, we have seen the volume increase nearly 7,000 percent, from 1.3 million barrels in 2008 to 88.9 million barrels in 2012. We see this trend continuing."

BNSF is connected to 16 of the top 19 oil-producing counties in central and western North Dakota, but petroleum isn't the only resource being shipped via railroad, said railway spokesperson Amy McBeth.

"For 2012, we will invest an estimated $86 million on maintenance and rail capacity improvement projects in North Dakota," McBeth said. "BNSF hauls more than 40 percent of Bakken production. In addition to oil, BNSF hauls inbound materials needed for each new well, such as sand and pipe."

Whether it is materials needed for hydraulic fracturing or the black gold itself, the industry has been counting on railway shipping. With pipeline projects -- including the infamous Keystone XL Pipeline -- being discussed and, in some cases, coming to fruition, certain logistical avenues could move away from the railroad. That, however, isn't expected to happen any time soon.

"Each year, BNSF also moves more than 15 million tons of wheat, soybeans, corn, sugar beets, beans and other agricultural products from North Dakota to plants around the country," McBeth said. "In all, we move more than 1.5 million carloads of freight in North Dakota annually. The top products by volume shipped from the state by rail are agricultural products, industrial products (which includes crude oil) and coal."

As far as what BNSF refers to as its "Dickinson Subdivision," the route going through Dickinson could be called the Grand Central Station of Oil Patch railway movement.

"Dickinson is one of the major rail yards BNSF has in the state," McBeth said. "Overall, we employ about 1,500 people in North Dakota."

Natural gas producers eye new processes

Evening Leader, The (St. Marys, OH) - Saturday, December 1, 2012

SYCAMORE, Pa. (MCT) - The towering flares that turn night into day in the Marcellus Shale gaslands are becoming an increasingly rare sight. Natural gas producers are turning to new techniques to capture the gas emitted during the well-completion process. In the past, a well's initial production was typically vented or burned offto allow impurities to clear before the well was tied into a pipeline.

Now, more operators are employing reduced-emission completions - a "green completion" - a process in which impurities such as sand, drilling debris, and fluids from hydraulic fracturing are filtered out and the gas is sold, not wasted.

The five gas wells that EQT Corp. completed in October at this remote site in Washington Township, Pa., are typical.

Compared to a gas flare, which roars like a jet engine and licks the sky with flame like a giant welder's torch, green completion is dull and quiet. EQT is not the only drilling company that has embraced green completions. The equipment for separating the gas from the "flowback" has been perfected in the past decade, and in the next three years, using it will become standard practice across the nation.

The U.S. Environmental Protection Agency approved new rules this year requiring green completions nationwide by 2015, except for exploratory wells unconnected to pipelines.

As of Oct. 15, drillers can no longer vent the gas into the atmosphere without burning.

The EPA says green completions will save drillers up to $19 million a year by capturing natural gas that would be wasted.

The advent of green completions is an example of the rapid development of shale-gas technology, which has revived a flagging domestic energy sector in just a few years.

"What was true yesterday is no longer true today," said Andrew Place, director of public policy research at EQT, based in Pittsburgh. "Systems are evolving."

Much of the new technology has been driven to address fears about drilling, including hydraulic fracturing , the extraction technique that has turned impermeable shale into a bonanza of oil and gas.

"Public concerns have pushed the engineers to come up with solutions," Place said.

Activists and regulators are paying more attention to air emissions from shale-gas development, including toxins emitted during drilling and production.

Much of the focus has been on releases of methane, the main component of natural gas as well as a potent greenhouse gas, though there is substantial disagreement over studies attempting to measure the methane leaks.

In devising the new rules, the EPA said it was acting under its Clean Air Act mandate to reduce emissions of volatile organic compounds and pollutants such as benzene, which can cause cancer. The agency said the new rules were expected to eliminate 95 percent of the smog-forming volatile organic compounds emitted from more than 13, 000 new gas wells each year.

The EPA said a "co-benefit" of green completions was a reduction in methane emissions by 1 million to 1.7 million tons a year.

The government delayed full implementation of the rule until 2015 to allow the industry to build enough equipment to handle the workload. The American Petroleum Institute and other industry groups are challenging the new rules in the U.S. Court of Appeals in Washington. So are environmental groups.

"We'd say the rules have not gone far enough," said Jay Duffy, a staffattorney with Philadelphia's Clean Air Council, which joined with Earthjustice in October to notify the EPA it planned to sue.

Oil, gas fracking view laid out for Brush chamber
Fort Morgan Times (CO) - Saturday, December 1, 2012
Author: KATIE COLLINS Brush News-Tribune
For more than 40 years the nation's oil and gas industry has been releasing natural gas through the process of hydraulic fracturing , also known as fracking .

Recently, however, this process has been held to high scrutiny as anti- fracking groups provoke negative insights into the impact of the drilling method and its use of chemicals in documentaries such as HBO's "Gas Land."

During the November luncheon held by the Brush Area Chamber of Commerce, community members and business owners gathered to hear from local industry experts such as Ken Strauch of J-W Wireline and Northeast Colorado Oil and Gas, as well as local fracking company representative Matt Hoffman.

The facking process involves capturing fluids out of the ground by drilling a well, then pumping liquid under pressure down the hole. The liquid fractures nearby rocks, thereby releasing a substance (generally natural gas these days) that has been trapped.

According to Strauch, educating the public about the process has become a big hurdle for many in the

industry, especially in light of documentaries such as "Gas Land."

Strauch and Hoffman showed a homemade documentary entitled, "Truth Land" in which a Pennsylvania school teacher takes up a mission to find the truth behind allegations made in "Gas Land."

During the video, and also during a question and answer session held by the industry reps in Brush, a common fear was exposed as a top worry for many citizens. That fear involved water contamination and usage.

According to industry officials, water and sand comprises 99.51 percent of the fluids used during fracking with the remainder involving chemicals used to reduce friction. According to Strauch, many of those chemicals can be found in household dish soap.

With Colorado having one of the most regulated oil and gas industries in the nation, rules concerning fracking are tight, aiding in the safety of fracking , Strauch and Hoffman said.

Along with thick pipe casing, cement and shale barriers as heavy inhibitors to groundwater contamination, industry officials also cited the fact that fracking occurs, in Morgan County, an average of depth of 5,800 feet, which is well below the average 600 feet where groundwater tables are.

The moment in "Gas Land" where a Colorado rancher actually ignites the water running from his faucet was also discussed, and in a followup Strauch relayed that after no traces of methane were found in this rancher's groundwater, the well he was using from his own land was tested and found to sit in the center of his corral, thus negating any fracking process as the culprit.

"We are your neighbors," noted Strauch to the audience of attentive listeners. "We live in these communities, we drink the water you drink and we don't want to bring any harm."

Water usage has also become a hot topic as fracking does involve a heavy usage of water for the process, however, as Strauch noted, that 85 percent of the state's water goes to agriculture, while only .08 percent goes to hydraulic fracturing .

Also, many hydrofracking rigs have been using recycled wastewater from treatment facilities.

With natural gas heralded as a safer and cleaner burning fuel than coal or oil, economic impacts were also divulged as crucial to communities who might allow the process.

In fact, many industrial processes, such as wind, solar energy and electricity, involve the use of natural gas and with 40,000 oil and gas employees in Colorado, in addition to supplemental companies, as many as 80,000 employees throughout the state are connected to this $12 billion dollar industry.

On the heels of cities such as Longmont recently having voters approve a ban on hydraulic fracturing in their city, Colorado business groups gathered to rally against such bans in light of such an economic impact, Strauch and Hoffman said.

Leaders of chambers of commerce from the Denver area were among about 200 hundred people who gathered at the Capitol on Tuesday, Nov. 13 to show their support for the oil and gas industry, the men said. They say energy can be developed responsibly and help the Colorado economy, and Colorado Oil and Gas Association officials say that Longmont's ban ignores community needs for oil and gas products, including electricity, commerce and transportation.

Although economic factors weigh heavily in the debate, so too does the safety of citizens and land.

In Colorado spills have been the only reported problems among the states nearly 49,000 active wells and, according to Colorado Oil and Gas Conservation Commission engineer manager Stuart Ellsworth, only one major spill (of more than five barrels) is reported each year.

"What we are talking about with fracking is risk, which is minimal," said Strauch, who also noted that the rigid regulations now in place are there to prevent just such hazards.

For more information, Strauch recommends visiting sites online such as fracfocus.org and neccoga.org.

The video "Truth Land," unlike "Gas Land" has been made available for free viewing via the web on sites such as YouTube, it was noted.

Fracking opponents protest in London

Independent Record (Helena, MT) - Saturday, December 1, 2012
Opponents of shale gas extraction are protesting amid reports the government is to green-light the controversial practice, known as fracking .

Campaigners delivered a letter Saturday to Prime Minister David Cameron's 10 Downing Street office calling the extraction of gas by hydraulic fracturing "an unpredictable, unregulatable process" that could poison the environment.

Advocates of fracking say tapping underground gas reserves could transform Britain's energy supply, but critics say the environmental risk is too great.

Cuadrilla Resources Ltd. halted work on Britain's only shale gas project last year after it triggered a series of small earthquakes in northwest England.

The Independent newspaper reports that the government will soon give the go-ahead to much wider exploration.

The government says it is still "too early to assess the potential for shale gas."
Caption: Slovenia police: 33 facing charges over violence

Holland delays decision on proposed plant

Muskegon Chronicle, The (MI) - Saturday, December 1, 2012
By Greg Chandler Credit: for mlive.com

HOLLAND -- The Holland City Council will wait one more week before making a final decision on whether to move ahead with construction of a $182 million natural gas-fired generating plant.

The council Wednesday postponed a decision on whether to proceed with the project, which has been recommended by the Holland Board of Public Works board of directors. A decision is now expected at the council's next meeting on Wednesday.

"There is a certain amount of urgency (to make a decision), but there's nothing that waiting a week will do anything to derail the process," Mayor Kurt Dykstra said.

The 114-megawatt facility, which would combine two gas-powered turbines and one steam turbine, would become the primary source of electric power generation for the utility as several coal-fired units at the James DeYoung plant on Lake Macatawa are phased out.

No location for the new facility has been selected, but during discussion at this week's meeting, BPW General Manager Dave Koster said there would be several factors that would play into where the plant would be built.

"You need to have access to roads, you need to have access to high-voltage (power lines) and you need to have access to (natural gas) pipelines," Koster said.

Supporters say the new facility will cut down on greenhouse gases and particulate emissions, but environmentalists continued to express concerns about hydraulic fracturing , or " fracking ," the process of drilling and injecting fluid into the ground at high pressure to break shale rocks below the surface to

release natural gas.

"It's irresponsible to not consider the impact of the extraction process of natural gas (on the environment)," resident Nicole Capizzi told council members.

"There's so many air pollutants used in the fracking process."

Environmentalists also want a firm commitment from BPW on retiring three of the coal-fired units at the DeYoung plant. BPW has proposed making no further investment in pollution control technology at that facility, with a 28-megawatt unit set to be shut down in 3-4 years. Two other units totaling 33 megawatts also could be phased out, but the U.S. Environmental Protection Agency is reconsidering regulations affecting those units, Koster said.

GOP Reps: Fracking Study Puts Oil Jobs in Peril

Newsmax.com - Saturday, December 1, 2012
Author: Stephen Feller
Several Republican members of the House expressed concerned in a letter Friday that a federal study into the environmental effects of fracking could put oil and gas industry jobs in jeopardy.

Members of energy and health committees sent the letter to Health and Human Sservices Director Kathleen Sebelius saying that if the study is not conducted fairly it could negatively impact the key industry.

The Centers for Disease Control may begin a study into reports that fracking — a method of extracting gas by pumping a high-pressure solution of water, sand and chemicals into underground rock formations to free up stores of shale gas — could pollute drinking water.

“Despite the significant growth of natural gas development, we are greatly concerned that the scientific objectivity of the Department of Health and Human Services is being subverted and countless jobs could be in jeopardy,” lawmakers said in the letter.

Five Republicans congressmen signed the letter. They are House Energy and Commerce Committee Chairman Fred Upton of Michigan; three subcommittee chairmen, Ed Whitfield, of Kentucky, Joe Pitts of Pennsylvania, and John Shimkus of Illinois; and past committee chairman Joe Barton of Texas.

If the studies identify naturally occurring chemicals in water as contaminants, new restrictions have the potential to put the brakes on a booming industry.

“We urge you to consult to state regulatory and public health officials who have much deeper experience monitoring the effects of hydraulic fracking than most federal officials have,” the congressmen wrote.

MYRIAD FRACKING SECRETS KEEP AMERICANS CLUELESS ON WELLS

Pittsburgh Post-Gazette (PA) - Saturday, December 1, 2012
Author: Ben Elgin, Bloomberg News
A subsidiary of Nabors Industries Ltd. pumped a mixture of chemicals identified only as "EXP- F0173-11" into a half-dozen oil wells in rural Karnes County, Texas, in July.

Few people outside Nabors, the largest onshore drilling contractor by revenue, know exactly what's in that blend. This much is clear: One ingredient, an unidentified solvent, can cause damage to the kidney and liver, according to safety information about the product that Michigan state regulators have on file.

A year-old Texas law that requires drillers to disclose chemicals they pump underground during hydraulic fracturing , or " fracking ," was powerless to compel transparency for EXP- F0173-11. The solvent and several other ingredients in the product are considered a trade secret by Superior Well Services, the Nabors subsidiary. That means they're exempt from disclosure.

Drilling companies in Texas, the biggest oil-and-natural gas producing state, claimed similar exemptions about 19,000 times this year through August, according to their chemical-disclosure reports. Data from the documents were compiled by Pivot Upstream Group, a Houston-based firm that studies the energy industry, and analyzed by Bloomberg News. Nationwide, companies withheld 1 out of every 5 chemicals they used in fracking , a separate examination of a broader database shows.

Trade-secret exemptions block information on more than five ingredients for every well in Texas, undermining the statute's purpose of informing people about chemicals that are hauled through their communities and injected thousands of feet beneath their homes and farms, said Lon Burnam, a Democratic state representative and a co-author of the law.

"This disclosure bill has a hole big enough to drive a Mack truck through," Mr. Burnam said of the law, which he called "much compromised legislation."

Is it "meaningless because there are so many exemptions?" he said. "I'm afraid it may be."

The Texas disclosure bill marks a growing effort by the oil and gas industry to address public concerns about fracking , a drilling technique in which millions of gallons of water, sand and chemicals are pumped underground to free up more hydrocarbons. While the method has unlocked vast new sources of energy, safety questions center on the hundreds of chemicals used -- many of them known carcinogens. The federal Environmental Protection Agency has little authority to regulate fracking ; Congress decided in 2005 that the bureau wouldn't oversee the practice.

The 2010 documentary film "Gasland" showed homeowners near fracked wells igniting the water that flowed from their faucets. A year later, the EPA linked fracking to contaminated drinking water in Pavillion, Wyo. The agency is retesting the Wyoming wells. A separate report from the U.S. Geological Survey this year confirmed the environmental agency's initial finding; it detected levels of methane, ethane, diesel compounds and phenol, which the EPA had identified in 2011.

Companies including Houston-based Halliburton Co. have embraced the Texas law as a model that "provides an enormous amount of information to the general public" while protecting trade secrets from competitors, said Susie McMichael, a company spokeswoman.

"Without such protection, companies would have no incentive to develop and put into use new technologies that are both environmentally beneficial and more effective," Ms. McMichael said in an email.

For neighbors of fracked wells, the omissions mean they can't use the disclosures to watch for frack fluids migrating into creeks, rivers and aquifers, because they don't know what to look for, says Adam Briggle, who is chairman of a citizen's group in Denton, Texas, called the Denton Stakeholder Drilling Advisory Group.

"We can't test to see what is coming into the environment," says Mr. Briggle, 35, who also works as an assistant professor of philosophy at the University of North Texas in Denton. "If frack fluids are so harmless, why do they hold onto these trade secrets so strongly?"

When Texas lawmakers were debating the disclosure bill, industry lobbyists made it clear that they wanted strong trade-secret protections, "but they didn't say it would be this heavily utilized," said Cyrus Reed, acting director of the Sierra Club's Lone Star chapter, who worked with companies to develop the rule. "It is disappointing to see this many trade secrets being claimed."

The law was signed by Gov. Rick Perry, a Republican, in June 2011.

Oil and gas companies are permitted to withhold disclosure of chemicals and their concentrations in any product that they claim to be a trade secret under the Texas law. Such claims can be challenged by state regulators and landowners of well sites or adjacent parcels.

Several other states that require disclosure of fracking chemicals -- including Louisiana, Montana, New Mexico and North Dakota -- also leave it up to energy companies to determine what chemicals can be labeled secrets.

Recently, more states are following the Texas model -- with an assist from industry. In December 2011, the American Legislative Exchange Council, a Washington-based public policy organization that brings together corporations and legislators to craft bills for states, adopted model legislation that is almost identical to the Texas rule.

The model bill was sponsored inside ALEC by Exxon Mobil Corp., which also advises the council from a seat on its "private enterprise board," according to ALEC documents obtained by Common Cause, a nonprofit in Washington.

So far, legislators in eight states have proposed bills based at least in part on the ALEC model, according to Todd Wynn, the director of the organization's task force on energy, environment and agriculture.

The main author of the Texas bill said other states will tailor the language to their needs.

"Can it be better, and should it be better?" said State Rep. Jim Keffer, a Republican. "Yes, and I think it will be better. People are going to use this bill as a base and then make it fit their state's attitude or their industry."

His Democratic co-author disagreed. It would be "a horrible mistake" for other states to use the Texas bill as a blueprint, Mr. Burnam said.

"Texas state government has been a wholly owned subsidiary of national oil and gas interests for a century," he says. "Do not look at it for guidance on anything related to protecting public health and safety."

Gardner to Salazar: Proposed BLM Fracking Rules Violate State Water Rights

Targeted News Service (USA) - Saturday, December 1, 2012
WASHINGTON, Nov. 30 -- Rep. Cory Gardner, R-Colo. (4th CD), issued the following news release:

Congressman Cory Gardner (R-CO) is pushing back on the Bureau of Land Management's proposed rules for hydraulic fracturing , saying that they represent a clear violation of state water laws. In a letter to Interior Secretary Ken Salazar, Gardner urges him not to let the BLM duplicate existing state regulations or encroach on state water authority.

"BLM's proposed rules could overstep their statutory authority over water, threatening all water right owners and undercutting the current system of state allocation and administration of water rights," Gardner wrote. "BLM's proposal creates federal approvals and mitigations for water source, water use, and water disposal. The rules give BLM veto authority over water use related to oil and natural gas development on federal lands, which is entirely inappropriate and an affront to Colorado system of prior appropriation."

Also of concern is that BLM's draft rules could actually discourage water recycling and reuse during the fracking process, which would be especially damaging to resources in the arid West. Gardner has always believed that the states, not the federal government, are best suited to manage their own natural resources.

BLM plans to finalize its rules by the end of the year. Gardner's bipartisan letter was signed by 43 members of the House.
* BLM.HydraulicFracturing.11.30.12.pdf (
http://gardner.house.gov/sites/gardner.house.gov/files/BLM.HydraulicFracturing.11.30.12.pdf)

Geosynthetics 2013 Addresses Water and Energy Challenges

Targeted News Service (USA) - Saturday, December 1, 2012
ROSEVILLE, Minn., Nov. 1 -- The Industrial Fabrics Association International issued the following news release:

The Geosynthetics 2013 conference and trade show, co-locating with the Southwest Geotechnical Engineers Conference and featuring the Geosynthetic Research Institute's GRI-25 Conference, will be held April 1-4, 2013, at the Long Beach Convention Center, Long Beach, CA.

The conference theme is Geosynthetics for Water & Energy Challenges, presenting a large array of major new developments in geosynthetics engineering and technologies through short courses, technical sessions, panel discussions and papers, plenary lectures and exhibiting hall. Attendees can earn up to 26 Professional Development Hours. Some key features include:

Energy/Shale Gas Fracking , an in-depth discussion of geosynthetic opportunities and solutions.

A plenary session presented by Mark Smith, PE, GE, SE, RRD International Corp., on the Emerging Issues in Mining Containment, including the current use of geosynthetics, the latest advancements and future of the industry.

A variety of full-day short courses, covering a variety of topics from an Introduction to Geosynthetics, to their use in road construction, landfills and ponds, containment facilities, testing procedures and material specifications.

The full schedule and registration is available online. Discounts apply for early bird registrations received before March 8, 2013; for groups of three or more from the same organization; students and government employees.

For more information, contact Bonnie J. Hanson at bjhanson@ifai.com or +1 651 225 6923.

Geosynthetics 2013 is organized by the Industrial Fabrics Association International (IFAI) and the Geosynthetic Materials Association (GMA), and supported by the North American Geosynthetics Society (NAGS) and the International Geosynthetics Society (IGS).

It's the environment, stupid
Telegraph Herald (Dubuque, IA) - Saturday, December 1, 2012
Author: From Timothy Mason 15563 Keystone Road, McGregor, Iowa
The silica sands being mined here in the Upper Midwest are transported to other states, mixed with dangerous secret chemicals, huge amounts of water and pumped under a great deal of pressure down into the earth as far as 10,000 feet to fracture shale deposits and recover remnant natural gas.

Every step of this industry is unsustainable, wasteful, toxic and dangerous to life. Fracking was pioneered by the Halliburton Corporation. Remember Halliburton? They enjoy huge war contract profits that wasted our tax dollars. Vice President Dick Cheney was CEO of Halliburton, and with his lobbying for Big Oil and Big Gas, he helped make them exempt from the Safe Drinking Water Act and the Clean Air Act. That's why the chemicals used in fracking are secret.

All this mining and drilling is not for our energy independence, it is for corporate profits. Make more billionaires out of millionaires. As Dr. Seuss stated in his now 40-year-old children's classic "The Lorax," "€¦I'm figgering on biggering and biggering and biggering!" Do you recall a couple election cycles ago, when the political mantra was "It's the economy, stupid?" Well, now in our dwindling natural world and the age of peak oil, I say "It's the environment, stupid!" To paraphrase musician John Prine's song, "Paradise":

"And daddy won't you take me back to Clayton County, down by the green river where paradise lay? Well, I'm sorry my son, but you're too late in asking Mister Pattison's sand train has hauled it away."

Shale commission holds first vote - Group agrees to safeguards that would pay for drilling problems

Cumberland Times-News, The (MD) - Friday, November 30, 2012
Author: Michael A. Sawyers, Cumberland Times-News
FINZEL — Fifteen months after its creation and during its 11th meeting, Maryland's Marcellus Shale Safe Drilling Initiative Advisory Commission held its first formal vote, agreeing unanimously to endorse financial safeguards that would pay for drilling-related problems.

Gathering Friday at the Eastern Garrett Volunteer Fire Department for the second time since being created, the commission's endorsements are intended to guide legislation that would be introduced into the upcoming session of the Maryland General Assembly.

The group agreed that:

• A minimum amount should be established for a performance bond that would be required of drillers attempting to extract natural gas by what is known as fracking .

• Drilling companies that have sufficient assets and financial stability should be allowed to self-insure.

• There should be a mechanism to verify that funds will be available to address environmental cleanups that are not covered by comprehensive liability insurance.

• The Maryland Department of the Environment should be allowed to periodically adjust required bond amounts based upon changing costs of reclamation.

Brigid Kenney, an MDE adviser to the commission, recommended that the commission provide specific legislative language for potential bills, but that concept was generally rejected by the members.

"Our intent is to be general, to identify broad areas for legislation," said Harry Weiss, an attorney with Ballard Spahr.

Jeffrey Kupfer, senior adviser with Chevron Government Affairs, concurred. "We need to agree on principles rather than on specific wording," he said.

Allegany County Commissioner Bill Valentine, as well, said, "We should support ideas."

State Sen. George Edwards suggested that financial bonds required of drillers mimic those for coal mining in that they are based upon some common denominator such as a cost per acre.

"So everybody will be on the same song sheet," Edwards said.

The commission members also spoke about the potential creation of a Surface Owners' Protection Act.

Edwards suggested that money needs to be pooled to protect the owners of the surface acreage beneath which the drilling and extraction of natural gas will take place.

"We need that to take care of the problem no matter who is liable," Edwards said. "Landowners don't have the money to sue these large companies."

Weiss said Maryland does not have a long and established history of court cases involving the rights of surface owners versus the rights of subsurface or mineral owners, but results have usually favored the subsurface owners.

Valentine said he believes that liability for damages from drilling should be upon the drilling companies rather than upon small subcontractors.

Senate and House sponsors in Annapolis will need to be found to introduce any legislation that results from the commission's research and discussions.

The group will next meet Jan. 27 in Annapolis.

The commission is to issue a report to the governor in 2014. Until then, no permits will be approved for Marcellus shale drilling in Maryland.

Contact Michael A. Sawyers at msawyers@times-news.com.

Heresy in Texas! The era of big oil is almost ove r

Dallas Morning News, The: Blogs (TX) - Friday, November 30, 2012
Author: Wayne Slater/Reporter

It sounds like heresy but there's a discouraging word coming out of energy-rich Texas: the days of booming oil production are almost over. A group of scientists, scholars and energy activists is meeting this week at the University of Texas to discuss what they see as an impending global decline in oil production. That would mean higher prices, more conservation, an emphasis on alternatives and lots of lifestyle changes. That's not something people want to hear – or that politicians are inclined to talk about, which has made it difficult to advance their message.

It's a big debate. Optimists say, no problem, there's plenty of oil underground — so much so that the U.S. will soon overtake Saudi Arabia as the world's biggest producer. That's the prediction from the International Energy Agency. On the other side are the peak oil advocates who arrived on the UT campus this week with facts, figures, scholarly papers and a dire warning – the end is near, like it or not.

"Why do smart people believe we have an infinite amount of energy?" Houston geologist Arthur Berman asked at Thursday's opening of a conference sponsored by the Association for the Study of Peak Oil & Gas. Berman cautioned against predictions about capturing trillions of barrels of untouched crude and new technologies that will make the U.S. energy independent. "Preposterous," he said. Berman is a leading critic of rosy shale predictions about production from " fracking " — injecting water and chemicals deep underground to force out pockets of gas. There's a fracking boom in Texas, including in the Barnett Shale near Fort Worth, but Berman warned it will be short-lived. "The economics don't work," he said, in part because unlike traditional oil production, fracking requires continual drilling even as reservoirs of gas are depleted. There are environmental issues and questions about how much water it uses. But shale supporters point to jobs and the immediate economic boost it provides.

"It's very difficult to fight the religious beliefs of anyone. And beliefs about energy supplies are very akin to religious beliefs," said UT petroleum engineering professor Tad Patzek. "You don't go to Midland and convince people to support President Obama — I tried." He said he went asked Midland Republicans whether there was anything he could say that would change their minds about Obama. No, he said, and convincing devotes of the oil patch that global oil production was about the decline was equally difficult. Peak-oil advocates have been challenging the industry's optimistic predictions of an oil boom and energy independence for about a decade, but for all their science, they've had problems advancing their message of an impending world oil shortage. The implications are bracing. "If we go on a diet of renewables, we're going to be slimmer," Patyzek suggests.

The conference goes through Saturday on the UT campus. There will be forums and presentations of scholarly papers. Among the speakers is Kjell Aleklett, a professor at Uppsala University in Sweden and leading peak oil theorist. Aleklett acknowledges that U.S. output has increased recently, in part because of the shale oil and gas bubble, but he defends the group's fundamental argument that drilling capacity will soon start going down. When that happens, he said prices will go up – and the cost of everything from gasoline to agricultural products will rise. He points to how crude oil reached a record $147 a barrel in July 2008. He says that could happen again, only this time it won't just be a spike.

Oxford sets date to vote on fracking moratorium

Evening Sun, The (Norwich, NY) - Friday, November 30, 2012
Author: MELISSA DECORDOVA Sun Staff Writer mdecordova@evesun.com

OXFORD - The Village of Oxford is on the verge of becoming the first municipality in Chenango County to signal its opposition to shale gas development should Gov. Cuomo and the state's environmental regulators permit drilling and hydraulic fracturing next year.

Trustees will vote on Dec. 11 whether or not to a impose a nine-month moratorium on gas exploration, extraction, and disposal in the village. A meeting to review the Oxford Fire Department's annual report was previously scheduled on that day, beginning at 7:30 p.m., and now the agenda will include time for this last piece of what has been a push since the spring to update the village's zoning laws and comprehensive plan with language that addresses the issues surrounding natural gas drilling.

"This buys us some time," said Mayor Terry Stark on Tuesday during a regular meeting of the board. "We want to put the industry on notice that we are stopping everything relative to gas drilling. We don't want people making financial decisions about us, like takings and investments."

At the end of the pause, Stark said the board would vote to either ban drilling in the village entirely, or allow it under special exemption.

A map of wells and spacing units shows three natural gas wells already drilled and capped in the town of Oxford, but none in the village. At least one landowner has leased his property within the village's borders to Norse Energy for future development. Many acres in the town are leased, and companies' drilling permits are pending. In addition, Emkey Energy plans to build a pipeline through the town that would eventually transmit gas both north and south through the county to connect to the state's major pipelines.

The governor and DEC Chief Joe Martens made clear this summer that municipalities' sentiments about shale drilling would be taken into consideration once permitting begins. Several town boards in the southern part of the county where the Marcellus is thick enough to drill have debated moratoriums, but all have decided to defer to the state's environmental conservation agency to regulate the industry.

Based on votes taken to this point to draft Oxford's new law (3 to 2) and to propose it (4 to 1), and considering the mostly pro-moratorium sentiments expressed by residents who attended a public hearing Nov. 13, the village's new local law seems certain.

At this week's board meeting, on Tuesday night, business owner Bryant LaTourette said he didn't think the ordinance was necessary. "Why does the village want it? I see things in the action plan, and I have some concerns that many of them are already contained within the SGEIS (the DEC's state regs). For example, the county is handling all of the emergency management and security." LaTourette also warned the mayor and trustees that moratoriums written by the David Slottje law firm, with whom the village consulted, were all being contested. "As we found out in Binghamton, and will find out in Dryden and Middlefield, it's illegal," he said. A moratorium in the City of Binghamton was recently overturned and notices of appeal of the ordinances in Middlefield and Dryden have been filed.

Also at the meeting Tuesday, local golf course owner Willard Bradley questioned why the trustees were using a recommendation from the Oxford Village Planning Board to pursue the moratorium. "Why put a lot of emphasis on what they have to say? They are, collectively, against gas drilling and wouldn't represent my concerns nor my point of view. I would like to have control over my own future, and not anyone else do it for me."

Stark said while the planning board recommended drafting a moratorium, the village board might have "done it on our own" because current zoning laws needed to be revisited anyway. He cited municipal level road use and fire protections that, he said, aren't contained within the SGEIS.

"The crux of the matter is redoing our own zoning laws, not just because of nat gas, but it's something we have wanted to do for years," he said. "Folks say our current zoning regs say gas drilling is prohibited, but it doesn't say that."

"This keeps the status quo for a period of time," he said.

Hard copies of the Moratorium and Appendix are available at the Village Hall during normal business hours.

A Young Death, Gas Wells, and Unanswered Questions - We have an unequivocal obligation to protect children from chemicals and the harm they cause , to the degree possible.
Salem-News.com (OR) - Friday, November 30, 2012
Author: Salem-News.com
(LEXINGTON, MA) - On Thanksgiving day a 19 year old boy died in upstate New York of acute lymphoblastic leukemia. Diagnosed with ALL when he was 9, his disease returned with a vengeance when he was 17.* He is the only child of a divorced mother who participated in Cure, a support group for families of children with cancer. When Cure's members learned that the boy lived on a farm where land was leased for gas wells when he was young, they urged his mother to talk with Judy Braiman, a Rochester activist who has worked for 30 years on environmental protections for children. Judy was instrumental in removing arsenic from playground structures, toxics from children's toys, and is now very concerned about the impact on children of gas extraction, including fracking .

The boy's mother was determined to find out if the gas wells were responsible. She felt that there were too many cases of childhood cancer in the area, a concern shared by others at Cure. She also knew that benzene, a chemical that can cause leukemia, was recently found in nearby wells. She responded to dozens of questions posed by Dr. Kathleen Burns, a toxicologist who works on the genesis of cancer and specializes in petroleum hydrocarbons such as benzene. Dr. Burns didn't find any other cancer-causing factors in the family or child's history - no other explanation for the leukemia that was taking the boy's life. But there was also no clear information on exactly what was in and around the well where the boy lived. Two years of searching produced no clear answers, though we still have hope that they exist.

We may never know with 100% certainty whether there was a connection between the boy's death and local water contamination. We may not know the source of benzene and other contaminants in the local water supplies. But we do know a great deal about many chemicals that can cause cancer, birth defects and other types of harm to our children. We know that many children live with these in their water supplies, food, and in the air of many polluted communities. Too many children are exposed to chemicals that will rob them of their health and longevity.

We have an unequivocal obligation to protect children from these chemicals and the harm they cause, to the degree possible. That doesn't mean to the degree that it is economically pleasing. It means we must place the health of our children above economic interests. Until people are willing to make difficult trade-offs and tell companies and government agencies to halt processes that involve toxic chemicals until safety can be guaranteed, we will continue to bury our sons and daughters. That is a trade-off that no parent should ever have to make and one that our society should not tolerate.

Judy Braiman, Director, Empire State Consumer Project, Rochester NY
Kathleen Burns, Director, Sciencecorps, Lexington MA www.sciencecorps.org

Organizations:
New York-wide group working on toxic chemicals and fracking : www.cectoxic.org
US & International: Global Community Monitor: www.gcmonitor.org
International: Health and Environment Alliance: http://www.env-health.org/ - good listserve on shalegas

There are many more good groups working on these issues.
Study: Acute childhood leukemia and environmental exposure to potential sources of benzene and other hydrocarbons; a case-control study. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1763669/pdf/v061p00773.pdf
*The child's name is withheld to protect his family's privacy.

Fracking chemical blends kept secret
Standard-Examiner (Ogden, UT) - Friday, November 30, 2012
Author: Amy Nicholson, Standard-Examiner
A subsidiary of Nabors Industries Ltd. pumped a mixture of chemicals identified only as “EXP- F0173-11” into a half-dozen oil wells in rural Karnes County, Texas, in July.

Few people outside Nabors, the largest onshore drilling contractor by revenue, know exactly what’s in that

blend. This much is clear: One ingredient, an unidentified solvent, can cause damage to the kidney and liver, according to safety information about the product that Michigan state regulators have on file.

A year-old Texas law that requires drillers to disclose chemicals they pump underground during hydraulic fracturing , or " fracking ," was powerless to compel transparency for EXP- F0173-11. The solvent and several other ingredients in the product are considered a trade secret by Superior Well Services, the Nabors subsidiary. That means they're exempt from disclosure.

Drilling companies in Texas, the biggest oil-and-natural gas producing state, claimed similar exemptions about 19,000 times this year through August, according to their chemical- disclosure reports. Data from the documents were compiled by Pivot Upstream Group, a Houston-based firm that studies the energy industry, and analyzed by Bloomberg News. Nationwide, companies withheld one out of every five chemicals they used in fracking , a separate examination of a broader database shows.

Trade-secret exemptions block information on more than five ingredients for every well in Texas, undermining the statute's purpose of informing people about chemicals that are hauled through their communities and injected thousands of feet beneath their homes and farms, said Lon Burnam, a Democratic state representative and a co-author of the law.

"This disclosure bill has a hole big enough to drive a Mack truck through," Burnam says of the law, which he called "much compromised legislation."

"Is it meaningless because there are so many exemptions?" he asked. "I'm afraid it may be."

The Texas disclosure bill marks a growing effort by the oil and gas industry to address public concerns about fracking , a drilling technique in which millions of gallons of water, sand and chemicals are pumped underground to free up more hydrocarbons. While the method has unlocked vast new sources of energy, safety questions center on the hundreds of chemicals used - many of them known carcinogens. The federal Environmental Protection Agency has little authority to regulate fracking ; Congress decided in 2005 that the bureau wouldn't oversee the practice.

The 2010 documentary film "Gasland" showed homeowners near fracked wells igniting the water that flowed from their faucets. A year later, the EPA linked fracking to contaminated drinking water in Pavillion, Wyo. The agency is retesting the Wyoming wells. A separate report from the U.S. Geological Survey this year confirmed the environmental agency's initial finding; it detected levels of methane, ethane, diesel compounds and phenol, which the EPA had identified in 2011.

Companies including Houston-based Halliburton Co. have embraced the Texas law as a model that "provides an enormous amount of information to the general public" while protecting trade secrets from competitors, said Susie McMichael, a company spokeswoman.

"Without such protection, companies would have no incentive to develop and put into use new technologies that are both environmentally beneficial and more effective," McMichael said in an email.

In August, the largest well-servicing companies that worked in Texas withheld the most information about frack jobs. Wells serviced by Halliburton and Houston-based Baker Hughes Inc., the second- and third-largest oilfield services companies respectively, contained more than nine secrets per well according to reports filed by the companies. Frack jobs by Superior Well Services, the Nabors subsidiary, omitted the most information with more than 32 secrets per well.

For neighbors of fracked wells, the omissions mean they can't use the disclosures to watch for frack fluids migrating into creeks, rivers and aquifers, because they don't know what to look for, says Adam Briggle, who is chairman of a citizen's group in Denton, Texas, called the Denton Stakeholder Drilling Advisory Group.

"We can't test to see what is coming into the environment," says Briggle, 35, who also works as an assistant professor of philosophy at the University of North Texas in Denton. "If frack fluids are so

harmless, why do they hold onto these trade secrets so strongly?"

Dennis Smith, a Nabors spokesman, didn't reply to several emails and phone messages requesting comment. Baker Hughes provides information on its fracking fluids "in a format that minimizes intellectual-property-rights risks to our products," according to a statement emailed by company spokeswoman Pamela Easton.

Halliburton's McMichael noted that the Texas rules were written with input from environmental groups, including Environmental Defense Fund, a New York-based environmental group whose president, Fred Krupp, has called the supply of natural gas that may be liberated by fracking "a potential game changer."

The Texas rules could "help industry do something that industry has trouble doing for itself - gain the public's trust," wrote Scott Anderson, a senior policy adviser to EDF, in an October 2011 letter to the Texas Railroad Commission, which regulates oil and gas drilling in the state.

Yet the regulations "could wind up hurting public confidence rather than helping," particularly if companies report fewer chemicals than the public expects, Anderson wrote. In an interview this week, Anderson said that while EDF considers the Texas rule "landmark legislation" that won industry support for disclosing chemicals, the group doesn't support the final version because it was watered down.

Industry lobbyists made it clear that they wanted strong trade-secret protections, "but they didn't say it would be this heavily utilized," said Cyrus Reed, acting director of the Sierra Club's Lone Star chapter, who worked with companies to develop the rule. "It is disappointing to see this many trade secrets being claimed."

The law, signed by Gov. Rick Perry, a Republican, in June 2011, requires companies to disclose their fracking chemicals on FracFocus, a national website that the energy industry helped create in 2011 to allow for voluntary disclosure. Bloomberg News reported in August that more than 40 percent of wells fracked in eight major drilling states last year had been omitted from the voluntary site.

Oil and gas companies are permitted to withhold disclosure of chemicals and their concentrations in any product that they claim to be a trade secret under the Texas law. Such claims can be challenged by state regulators and landowners of well sites or adjacent parcels.

Several other states that require disclosure of fracking chemicals, including Louisiana, Montana, New Mexico and North Dakota, also leave it up to energy companies to determine what chemicals can be labeled secrets. North Dakota's rule requires companies to report fracking chemicals to FracFocus, beginning last April.

"We require whatever FracFocus requires," said Alison Ritter, a spokeswoman for the state Department of Mineral Resources' Oil and Gas Division.

The FracFocus website states that chemicals should be disclosed unless they're a trade secret, as defined by the Occupational Safety and Health Administration. The operators of FracFocus, which is supported by funds from the industry, don't check trade-secret claims or offer a way to challenge an exemption.

Mike Paque, the executive director of the Groundwater Protection Council, a group of state water officials that's one of the operators of FracFocus, didn't respond to requests for an interview.

"We have successfully fulfilled our commitment . . . to ensure that Texans know every single ingredient used in the hydraulic fracturing process," said Elizabeth Ames Jones, then-chairwoman of the Texas Railroad Commission, when the law was signed last year. "Texans can be assured they will know more about what is going into the ground for fracturing than what goes into a can of soda," she said.

Jones said this month that she's proud of what Texas did. "There are people who want to use scare tactics to drive an agenda that is not good for America," she said in an email.

The 19,000 trade-secret claims made in Texas this year through August hid information that included descriptions of ingredients as well as identification numbers and concentrations of the chemicals used. Overall, oil and gas companies withheld information on about one out of every seven ingredients they pumped into 3,639 wells.

In 5,000 other instances, Texas well operators failed to disclose information without saying why, filling in boxes on forms with “N/A” or “mixture,” for example, or leaving them blank. Such omissions raised the total to almost seven secrets per well from about five.

Nationally, companies claimed trade secrets or otherwise failed to identify the chemicals they used about 22 percent of the time, according to a Bloomberg News analysis of FracFocus data for 18 states. The data were compiled and released this month by SkyTruth.org, a website that uses data and digital mapping to investigate environmental issues.

Among states with at least 250 fracked wells, Oklahoma had the most unknown components; almost a third were listed as trade secrets or had no valid identification numbers attached to them.

A smaller sample from Texas, the 370 wells that were reported in August 2012, showed that the number of secrets per well increased to almost eight when small frack jobs - those using less than 100,000 gallons of water - were excluded.

Although oil and gas companies submit the disclosures, the well-servicing companies they hire decide which chemicals will be disclosed or kept secret, said Halliburton’s McMichael and others. The number of ingredients they withhold from disclosure can vary widely, based on the August data.

Wells serviced by Geneva-based Weatherford International Ltd. averaged 0.1 secrets per well, while Baker Hughes averaged 9.1; Halliburton, 9.3; and Superior Well Services, 32.5.

Melanie Kania, a spokeswoman for Weatherford, declined to comment.

Most of the secret chemicals are described only in general terms, such as “polymer” or “surfactant,” leaving little clue about their contents, said Theo Colborn, president of The Endocrine Disruption Exchange. The Paonia, Colo.-based nonprofit, which is staffed by scientists, studies chemicals that interfere with human development and has criticized regulatory approaches to fracking .

Texas wasn’t the first state to require disclosure of frack ingredients. In September 2010, Wyoming enacted a similar law, which requires an extra step to claim a trade secret. Companies need to apply with state regulators to explain why they need trade-secret protection for specific ingredients.

Since that rule went into effect, the Wyoming Oil and Gas Conservation Commission has approved 78 additives as trade secrets and rejected six such requests, according to Lori McCoy, a support specialist for the state agency.

Recently, more states are following the Texas model - with an assist from industry. In December 2011, the American Legislative Exchange Council (ALEC), a Washington-based public policy organization that brings together corporations and legislators to craft bills for states, adopted model legislation that is almost identical to the Texas rule.

The model bill was sponsored inside ALEC by Exxon Mobil Corp., which also advises the council from a seat on its “private enterprise board,” according to ALEC documents obtained by Common Cause, a nonprofit group in Washington.

So far, legislators in eight states have proposed bills based at least in part on the ALEC model, according to Todd Wynn, the director of the organization’s task force on energy, environment and agriculture.

The main author of the Texas bill said other states will tailor the language to their needs.

“Can it be better and should it be better?” asked State Rep. Jim Keffer, a Republican. “Yes, and I think it will be better. People are going to use this bill as a base and then make it fit their state’s attitude or their industry.”

His Democratic co-author disagreed. It would be “a horrible mistake” for other states to use the Texas bill as a blueprint, Burnam said.

“Texas state government has been a wholly owned subsidiary of national oil and gas interests for a century,” he says. “Do not look at it for guidance on anything related to protecting public health and safety.”

— With assistance from Jim Polson.

NY Gov: Fracking regs likely delayed into 2013

Chronicle, The (Goshen, NY) - Thursday, November 29, 2012

ALBANY — A health impact review of shale gas drilling by national experts will make it impossible to meet a looming deadline for new fracking regulations, Gov. Andrew Cuomo said Nov. 27, pushing a much-delayed decision on the contentious issue into 2013.

The Department of Environmental Conservation has been doing an environmental impact study and drafting new regulations for high-volume hydraulic fracturing , or fracking , since 2008. Shale drilling has been on hold since then amid health and environmental worries surrounding fracking , which stimulates a well's production by injecting huge volumes of chemical-laced water to crack deep, gas-rich shale deposits.

The deadline for finalizing regulations is Nov. 29 under the state Administrative Procedures Act, which says a proposed rule expires 365 days after the last public hearing unless it's officially adopted by then. If the regulation isn't finalized by the deadline, the agency has 90 days to submit a new notice of rulemaking, and another 90 days to complete the job. That could potentially delay a final decision for six months. The public would have the opportunity to comment during that time.

A panel of three nationally recognized public health experts was named last week to review the state's health impact study of fracking . Cuomo told a radio interviewer he sees no way the panel's work can be completed by the end of next week.

Asked about it at a press conference on Nov. 27, at the Javits Center in New York City, Cuomo said he doesn't have a timeline for completion of the health review and fracking regulations, but he doesn't expect it to be finished within the next week.

“This is a big decision for the state," Cuomo said. “It has potential economic benefits if the state goes forward with fracking , but we want to make sure it's safe and we want to make sure the environment is protected, people are protected and that's why we're doing a health assessment."

The experts chosen for the health review were John Adgate, chairman of the Environmental and Occupational Health Department at the Colorado School of Public Health; Lynn Goldman, dean of George Washington University's School of Public Health and Health Services; and Richard Jackson, chairman of the Department of Environmental Health Sciences at the University of California Los Angeles' Fielding School of Public Health.

Goldman said she hadn't seen the state's health impact assessment yet and didn't know how extensive it was. But she said she planned to have her review completed by the end of next week because of her schedule of other commitments. Goldman said her contract with the state set a deadline of Feb. 12, but she had been told in an email that officials wanted the review done by Dec. 3.

“Generally, I'm applauding them for making the effort," Goldman said of New York's health study. “I hope the outcome of our doing this review helps the state make a wise decision."

Industry groups have criticized the choice of health experts to review the state study, saying they're biased against the industry.

“Each of these experts has shown a troubling willingness to speak publicly about supposed dangers and risks of hydraulic fracturing ," said Lee Fuller, executive director of the industry group Energy In Depth. “While voicing concerns is an understandable and at times necessary function of scientific progress, these experts have chosen to make statements that contradict well established scientific conclusions about both hydraulic fracturing and shale development."

John Krohn, a spokesman for Energy In Depth, said that while it's disappointing to learn of the latest delay, Cuomo's decision not to rush the health review will give the natural gas industry time to make recommendations so the review panel “can have an increased diversity of opinion."

Environmental and health groups have praised the choice of panelists and were cheered at word of the latest delay in a final decision on whether fracking will be allowed in New York.

“We are glad the Governor wants to 'do this right,'" said Sandra Steingraber, a representative from the anti- fracking coalition New Yorkers Against Fracking . “We are confident that a thorough, independent review of the health impacts of fracking will show it can't be done safely."

Arkansas Prepares For The Future of Water

Fayetteville Free Weekly (AR) - Thursday, November 29, 2012
By Luke Simons

Let’s step back to summer 2012.

And focus on the part that probably every one of us would like to forget and hope never happens again: our nation’s severe drought. Recall the size of A/C bills and wildfires out West, especially those in Colorado. In the month of June alone, the United States broke or tied 3,215 high-temperature records. And that was just June — the summer heat just continued to make itself more pronounced. We’ve seen some hot summers recently in Arkansas, but this past one was unusual, with dried up fields and pastures, failed crops and dead livestock. When it’s all said and done, the losses and impacts are likely to total in the billions. In a state endowed with good water resources, we could not escape the impacts of a severe drought.

When extremes like this occur there are innumerable concerns, both immediate and long-term. Often times, much of these concerns feel out of our control and too big to wrap our heads around. We may wonder, is my community or state prepared to handle a serious water shortage?

It is important to look at events of this past summer and the likelihood of them returning, albeit in a world where water will be only more precious. Our state has started down the path of reanalyzing water and its crucial place in each citizen’s life. It couldn’t have come a year sooner.

Water in Arkansas

Our state legislature has recently passed funding for a new state water plan. The Arkansas Natural Resources Commission (ANRC) has been pushing for such funding for the past several years. Our current plan dates back to 1990. In that amount of time, much has changed: from demographics to resource allocation to monitoring technology to ecological impacts and much else. Not only do we need to account for a significantly different era than that of 20-plus years ago, but we need to envision a better future for our state and its citizens.

Funding of $1 million of state (i.e. citizen) was approved to start on a plan that will, not only, be applicable now but projecting out to future needs as far as 2030. It will take shape over the next two years, and a working plan — i.e. one that doesn’t just lead to arguing — is to be delivered to state government in November 2014. The citizens of Arkansas have been invited to help steer the future of this plan.

The Next Two Years

Two water consulting firms (CDM Smith and FTN Associates) have been brought in to accumulate and process the data and, ultimately, in the delivering of decisions that will form the basis of a new plan. They will be working with state branches of the U.S. Army Corp of Engineers, U.S. Geological Survey and the ANRC. I should point out that the ANRC is divided into three divisions: Conservation, water development and water management. It is the water management division that will ultimately be "responsible for the development, updates to, and implementation of the Arkansas Water Plan (Arkansas Water Plan)." (1)

Over the next two years, public meetings are set to be held throughout Arkansas at strategic points along the roadmap towards completion. These are forums for the community to find out about progress and ask questions. The first such meeting was an official kickoff which happened Tuesday night Nov. 13, on the University campus here in Fayetteville. Since then, three additional kickoffs have either occurred or are about to occur in Jonesboro, Little Rock and El Dorado.
Fayetteville's kickoff brought together a crowd approaching 80-100 citizens making up a well-represented cross-section pulling from many sectors including wastewater, navigation, environment and recreational. One of the consultants presided over what proved to be a very informative hour-and-a-half meeting. The need for a new plan was underscored in light of changes in water use and values, as well as new collection and analysis tools. Agricultural and municipal water needs have seen significant increases in demand. According to a chart provided, irrigation alone accounts for over 4,500 million gallons per day – more than double the next highest water usage sector (Thermoelectric).

The two-year roadmap is ambitious, to say the least. A high-level, two page draft of the vision and goals was provided at the kick-off and it is filled with needs to optimize all water, utilize the best technology and science and identify opportunities for improvement. From waste water to living ecosystem – seemingly everything is identified for analysis. The major milestones will be completion of demand forecasting (Spring 2013), completion of supply forecasting (Fall 2013), and development of solutions (Early spring 2014). It is at the end of each of these milestones that public meetings will occur around the state.

Water Issues

So what are some of the issues? At the kickoff meeting there were plenty of questions from attendees and many questions focused around the quantity and quality of our area water. There was certainly an environmental and geologic appreciation apparent for natural water sources not adhering to state boundaries. Rivers move between states, and aquifers subsist below certain regions.

Concerns included: the Fayetteville Shale (Arkoma Basin) and water contamination from hydraulic fracturing . Also, aquifer depletion, in particular along the Delta where significant amounts of this water are used for irrigation. There were other questions around the continued growth in Southeast Missouri and potential need to expand their access to the Beaver watershed. Also, how dependable of a water source will the Arkansas River (which crosses our state from the west into the Mississippi River) be five years from now? Questions like this point to compacts that exist between states – these too will only become (literally and figuratively) hotter topics in coming years.

Water concerns abound at all levels: Internationally – desertification, countries (and private parties) buying water rights in other countries; Nationally – water wars out west, natural gas drilling (i.e. hydraulic fracturing), PepsiCo, Coca Cola and Nestle (in particular) buying land over natural springs and ciphering out huge amounts of community water to put in plastic bottles; obsolete dams and their interference with ecosystems.

As communities and states feel more of a pinch on their water needs, expect them to start looking elsewhere. We in Arkansas might not be so far removed from the great water wars out west. Just consider the impact of recent droughts on neighboring states like Oklahoma and Texas and the battle for water from the Red River (which also impacts Arkansas), and Oklahoma significantly revising their state's water plan. Ten years from now, even if we wanted to give water, it would be embarrassing to have to say "we'd love to but too much of ours is contaminated from hydraulic fracturing ."

Getting Involved

The official website for Arkansas Water Plan is ARWaterPlan.Arkansas.gov. They also have a profile on Facebook that includes links to several documents. Locations and times for future meetings will be located here, soonest being May/June 2013. At the kickoff the moderator encouragement feedback from citizens, and we all should take advantage of this and keep on top of progress.

Resources

1. 'Building Strong Collaborative Relationships for a Sustainable Water Resources Future: State of Arkansas, Summary of State Water Planning' PDF. The Army Corp of Engineers 2009
Caption: Water use by sector (2005) Timeline for Arkansas' Water Plan. Beaver Lake after several days of rain Beaver Lake after several days of rain

Groups Representing Millions of Americans Say No to Fracking

Targeted News Service (USA) - Thursday, November 29, 2012
NEW YORK, Aug. 14 -- Environment New York issued the following news release:

Amid reports that a decision on fracking in New York is imminent, national environmental organizations - collectively representing millions of members across the country - sent a letter to Governor Cuomo today urging him to heed concerns raised by scores of local and statewide groups over dirty drilling. Those state groups in June called Governor Cuomo's plan to allow fracking in five upstate counties inconsistent with his pledge to protect public health and the environment.

"Across the nation, every place they frack we see water contamination, air pollution, terrible health implications, and great costs to local communities" said Margie Alt, Executive Director of Environment America and one of the signers of the letter to Governor Cuomo. "We hope Governor Cuomo realizes the eyes of the nation are upon him - he can lead NY toward clean energy and a healthy environment or he can continue to push for dangerous drilling."

As Governor Cuomo mulls a decision on whether to allow fracking in New York, the dirty drilling process is exacting a grave toll next door in Pennsylvania - including drinking water contamination, wellhead explosions, and nearby families getting sick from pollution. Fracking and its waste have been linked to these and other problems elsewhere - from earthquakes in Ohio and Arkansas to groundwater contamination in New Mexico.

"In this haste to drill, I and other hunters and anglers fear that many of the environmental impacts of fracking , like air and water pollution, are being ignored," said Larry Schweiger, President of the National Wildlife Federation.

With evidence on fracking damage mounting, other states are now moving to stop it. In the past few months, the New Jersey legislature voted overwhelmingly to ban fracking waste and Vermont outlawed the dirty drilling practice entirely. Similar proposals are gaining ground in other states as well, including moratorium bills introduced in Illinois and California.

"People around the country are standing up to the oil and gas companies and organizing to defend their communities from fracking and the air and water pollution it brings. Governor Cuomo should stand with those communities, not with an industry that puts secret chemicals and profits above everything else," said Phil Radford, Greenpeace Executive Director.

Reports this summer indicate that the Governor's latest plan is to pilot fracking with 50 wells in five counties, with the number of permitted wells growing in future years. But once the door is opened, no one doubts that the oil and gas industry will move aggressively to expand fracking across New York.

"With four years of permit violations and disasters in Pennsylvania, there's nothing new for the Governor to learn from a pilot project in New York," said David VanLuven, Director of Environment New York. "With

the eyes of the nation on him, we need Governor Cuomo to stand tall against dirty drilling."

The national organizations sending the letter were:

American Rivers
Clean Water Action
Greenpeace USA
Earthjustice
Earthworks
Environment America
National Wildlife Federation
National Parks Conservation Association
Physicians for Social Responsibility
Sierra Club
The Wilderness Society

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New Fracking Comment Period Begins Dec . 12
USA TODAY (Arlington, VA) - Thursday, November 29, 2012
Author: Jon Campbell, Albany Bureau: (C) Gannett News Service
By Jon Campbell, Albany Bureau

ALBANY -- Beginning Dec. 12, the public will have a new chance to comment on the New York's proposals for shale-gas drilling, the state announced late Thursday.

The state Department of Environmental Conservation on Thursday quietly posted 90 pages of newly revised, proposed regulations for hydraulic fracturing , a required step to receive a 90-day extension on a deadline that had been set for that day.

Those regulations will be subject to 30 days of public comment, beginning Dec. 12 and ending Jan. 11 at 5 p.m.

The DEC had originally faced a Thursday deadline to finalize its proposed hydrofracking rules, which were originally unveiled in September 2011. But late Wednesday the agency filed for a 90-day extension, a move that requires a "substantially revised" set of proposals to be released and opened to comment.

Environmental groups and critics of hydrofracking have blasted the DEC for seeking the extension, saying any revisions should wait until the state receives much-anticipated input from a panel of academic health experts. The three experts were tasked earlier this month with giving the state advice on how to prevent or limit the potential negative effects of hydrofracking , a much-debated technique used to fracture shale formations and release natural gas.

"Ignoring the ongoing health and environmental review processes by rushing new rules that have to be finalized by the end of February appears to be either politically motivated or messy administration at the expense of all New Yorkers," read a statement from the New York Water Rangers, a coalition of fracking critics.

A DEC spokeswoman did not respond to a request for comment.

The state first launched an environmental review of large-scale hydrofracking in 2008, and the technique has been on hold in New York ever since. The DEC has said it won't approve any permits for the process until that review is completed.

The proposed regulations follow a separate rule-making track that is mandated by state law. With the 90-day extension, the DEC has to finalize their proposals by March or restart the rule-making process altogether.

Earlier this week, a statewide group of landowners looking to lease their gas rights to drillers said it was "cautiously optimistic" that "an end is in sight to the over 4.5-year-long regulatory process."

"New York landowners, farmers, businesses and taxpayers hope that New York can finally bring an end to this process and begin realizing the environmental and economic opportunities enjoyed by our neighboring Marcellus Shale states," a statement from the group read.

It wasn't immediately clear what had been changed in the state's newly revised proposals, which contain rules for where gas wells can be sited, how they're constructed, how close drilling can occur to water supplies and other preventative measures. The previous set of proposals appeared to have been removed Thursday from where they once were on the DEC website.

The DEC faces a potentially tall task if it hopes to meet its extended deadline, which will be pushed back to late February or early March. It will likely receive thousands of new comments on its proposals -- two previous comment sessions on various stages of the hydrofracking review received more than 80,000 total -- and will have to assess them in order to comply with state law.

Meanwhile, the state late Thursday also revealed what it will be paying for the work of the three health experts who are assisting with its review of hydrofracking .
The Colorado School of Public Health will be paid $480 an hour for the work of John Adgate, the chair of the school's Department of Environmental & Occupational Health. George Washington University will be reimbursed at a rate of $241.68 for each hour worked by Lynn Goldman, the dean of the university's public health school.

The state will be on the hook for a maximum of $12,000 each, according to their contracts, which run through mid-February.

A third expert -- Richard Jackson of the University of California, Los Angeles -- will be working pro bono, according to the state Deparment of Health.

The three academic professionals were tapped by the Health Department earlier this month.

"The consultants were selected based on their scientific expertise, credentials and knowledge of the subject matter," said Bill Schwarz, an agency spokesman.
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Genesee County Gas Driller Sues Town , DEC
USA TODAY (Arlington, VA) - Thursday, November 29, 2012
Author: Jon Campbell, Albany Bureau: (C) Gannett News Service
By Jon Campbell, Albany Bureau

ALBANY -- The state Department of Environmental Conservation may soon have to weigh in on a local gas-drilling moratorium after a Genesee County-based company filed suit against the agency.

Lenape Resources, a small natural-gas company based in Alexander, sued both the DEC and the Livingston County town of Avon earlier this month, claiming the town's recent moratorium on gas drilling and storage doesn't comply with state law.

The company is also seeking $50 million from the town, claiming the ban has cost Lenape millions in the form of lost business and unused mineral rights. Avon's annual budget is about $3 million, according to Supervisor David LeFeber.

"It is my business," said John Holko, Lenape's president. "It's all I do and what I've spent all the money for in the area, and I don't have much of a choice but to take an action."

Avon passed a one-year moratorium on natural-gas extraction and underground storage that took effect

in June. The moratorium includes a "grandfather clause" for existing wells, though Holko claims it isn't nearly broad enough and forced him to shut down.

LeFeber declined comment Thursday on the lawsuit, which was filed on Nov. 13.

The lawsuit represents at least the fourth attempt in New York to overturn a local ban or moratorium on drilling or hydraulic fracturing , the much-debated technique used to release gas from underground shale formations.

Two of those challenges -- including one against the town of Dryden, Tompkins County -- were rejected by state Supreme Court justices and are currently being appealed. The third, against the city of Binghamton, was successful in the lower court after a judge ruled the city couldn't prove there was a dire need to prevent gas drilling.

Lenape's suit, however, is unique: It marks the first time the DEC has been included in such a challenge, and it seeks damages from the town.

The company claims state law doesn't allow municipalities to ban gas or oil drilling. Enforcement of that law, the company's suit claims, lies with the DEC.

"This issue is before the courts and we will let that process progress," DEC spokeswoman Emily DeSantis said.

Michael Joy, an attorney for Lenape, said the company hopes the judge will overturn the moratorium based on the state's environmental law, not Lenape's $50 million "takings" claim.

"If, in fact, it does not happen, the towns cannot have it both ways," Joy said. "They can't have the authority to take property rights away -- and in the case of Lenape, take tens of millions of hard dollars that they invested in wells and infrastructure -- and not expect to have to compensate the company for what they did."

Deborah Goldberg, managing attorney for Earthjustice, a group representing Dryden in its own case, said Lenape is throwing "everything but the kitchen sink" at Avon.

"All of their wells have been grandfathered in," Goldberg said. "They don't have a valid right to develop new wells. They haven't been injured in any way. It's hard to imagine how this could possibly be a ripe claim."

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Group seeks ban on fracking within 20 miles of city

Athens Messenger, The (OH) - Wednesday, November 28, 2012
Author: Sara Brumfield; Messenger Staff Journalist
A new group of concerned Athens citizens has proposed that the city adopt a "bill of rights" intended to ban shale gas and oil extraction and related activities within 20 miles of the city limits.

On Monday, resident Dick Mc-Ginn spoke to Athens City Council on behalf of a group that was formed in the past couple weeks. He said the group adopted the name Bill of Rights Committee, or BORC.

According to McGinn, members of the group include himself, 2nd Ward Councilman Jeff Risner and residents John Howell, Richard Hogan, Milenna Miller, Christine Hughes, Beverly Flanigan and Ed Newman.

McGinn said the group met for the first time officially on Monday before the Council meeting.

"What we have is a committee to enact a community bill of rights with the aim of banning fracking and associated activities in, at, or near the aquifer that supplies water to the city of Athens," he said.

Council has discussed ways to protect the city's water supply from any possible negative effects that could come about from hydraulic fracturing , or " fracking ," however the state maintains the sole authority to regulate any oil or gas drilling in Ohio.

According to a draft of the proposed ordinance provided by Mc-Ginn to The Messenger, the Ohio Revised Code (Title VII, Chapter 743, Section 25) gives the city jurisdiction to prevent pollution of its water supply 20 miles beyond the municipal corporation limits.

"So we're talking about an ordinance that would ban fracking within 20 miles of Athens," McGinn said.

The bill of rights is not only intended to ban fracking in and around the city, but to also "subordinate the privileges bestowed on corporations to the rights and governance of the people."

"This ordinance removes legal powers and authority from gas extraction corporations within the city, in recognition that those legal powers are illegitimate and unjust" the draft legislation states.

It continues that commercial extraction of shale gas and oil and related production activities "cannot be achieved without violating the rights of residents and communities or endangering their health, safety and welfare."

The rights laid out in the proposed legislation include the right to water, rights of natural communities to exist and flourish, and the right to a sustainable energy future.

It also states that neither individuals nor corporate entities shall enjoy special privileges or powers under state law; that the city of Athens is the governing authority responsible to, and governed by, the residents of the city; and that the rights in the ordinance shall be enforceable against individuals, corporations and government entities.

"It's clear that this city council is determined to do something about this fracking and the danger that it poses to our community and so this here's another resolution," McGinn said. "Here we're talking about a possible win."

McGinn continued, "This city council has already done everything it can possibly do to handle this situation, to deal with this situation within the confines of current laws and regulations and it's still not enough What this ordinance presents is an alternative approach that appeals to the wording of the Ohio State Constitution that gives priority to human beings, to their rights, to their pursuit of happiness" The Bill of Rights Committee is urging Council to pass the ordinance and then put it on the November 2013 ballot as a referendum.

McGinn said if Council does not do so, the group will pursue the matter itself and seek to put the issue on the ballot as an initiative.

"We know we will win when it comes to a ballot decision," he said.

McGinn said the proposed legislation the group is urging Council to adopt was drafted with the help of the Community Environmental Legal Defense Fund, which, according to the organization's website, "provides free and legal services to community-based groups and local governments working to protect their quality of life and natural environment."

Councilwoman Chris Fahl suggested that Council revisit the issue after the beginning of the new year since Council will only meet three more times in 2012.

Councilman Steve Patterson urged citizens to contact their Council representatives to let their opinions on the topic be heard.
Memo: · "What we have is a committee to enact a community bill of rights with the aim of banning fracking and associated activities in, at, or near the aquifer that supplies water to the city of Athens."

Dick McGinn, speaking for the Bill of Rights Committee

Carbondale Votes Unanimously to Support Statewide Fracking Moratorium

Targeted News Service (USA) - Wednesday, November 28, 2012
CARBONDALE, Ill., Nov. 14 -- Environment America issued the following news release:

In a unanimous decision, the Carbondale City Council passed a resolution calling on the Illinois General Assembly to "enact a moratorium on high volume horizontal hydraulic fracturing until such time as the health and environmental concerns of the people of Illinois are addressed". In this decision, Carbondale joins the Illinois towns of Carlyle, Anna and Alto Pass and Union and Jackson Counties in taking action supporting a moratorium, becoming the largest city yet to do so.

Horizontal high-volume hydraulic fracturing is a new technique for extraction of natural gas contained within shale rock. The technique, recently popularized by its controversy and environmental impacts in Ohio, Pennsylvania and elsewhere, involves pumping millions of gallons of freshwater mixed with toxic chemicals into horizontal wells at high pressure to break up shale rock and release natural gas.

"In every state where fracking has occurred, impacts such as severe illness, polluted and depleted drinking water, hazardous waste leaks, earthquakes, explosions and air pollution have come with it--no state has shown that it can be done safely", argued Bruce Ratain, a Clean Energy Associate with Environment Illinois.

Though horizontal fracking is still on the cusp of commencing on a large scale in Illinois, the state already has notable scars from traditional vertical fracking , considered less dangerous than new high volume, high pressure horizontal fracking . Barb McKasson, Chair of the local Shawnee Group of the Illinois Sierra Club related one jarring story:

"We started going to counties testing water, and through that process met Steve Combs, who lives in White County. His life has been ruined by fracking ; his health is very poor. Steve had stopped drinking the water from his well, but didn't realize that simply showering in the contaminated water could still make him sick. His neighbors' wells are also affected, and this is just from vertical fracking . The horizontal hydrofracking is ten to a hundred times higher in volume and impact."

Last night's decision demonstrated an awareness of fracking 's impact in a city often associated with fossil fuel production. "In Fort Worth, they have frack pads right next to schools...the council members came to realize that we need more protection than our current zoning laws", noted Lynn Waters, a local resident and activist with SAFE (Southern Illinoisans Against Fracking) who addressed the Council at last night's meeting.

"This is educating the citizens of Carbondale to realizing that just because they live in the city, they're not immune to the effects of fracking that might occur next door, and, it has taken place within cities", noted McKasson, who also spoke at last night's hearing.

A statewide coalition of groups including Environment Illinois, SAFE and the Sierra Club has been pushing for a statewide moratorium on fracking , presented in SB 3280 currently before the state legislature. "Carbondale has taken a stand for public health and the environment; now its time for Illinois to stand up for them and communities statewide by passing a moratorium" concluded Ratain.

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New Report Details Cost of Fracking

Targeted News Service (USA) - Tuesday, November 27, 2012
RALEIGH, N.C., Sept. 20 -- Environment North Carolina issued the following news release:

Joined by several local elected officials from Creedmoor to Chatham County, Environment North Carolina Research & Policy Center today released a report documenting the monetary costs imposed by " fracking

," the controversial form of gas drilling the General Assembly moved to legalize in July. As documented in the study,http://www.environmentnorthcarolina.org/reports/nce/cost- fracking fracking creates millions of dollars of costs--many paid at the local level--related to everything from contaminated drinking water to accidents that require emergency response.

" Fracking 's threat to our drinking water is bad enough, but it turns out that this dirty drilling also imposes heavy dollars-and-cents costs," said Elizabeth Ouzts, Environment North Carolina State Director. "And that is all the more reason we must keep North Carolina free from fracking ."

One of the worst problems associated with fracking is the contamination of drinking water, and that comes with a price tag. For example, In Dimock, Pennsylvania, fracking operations contaminated the drinking water wells of several households for roughly three years, perhaps more. Providing just 14 of those families with temporary water cost more than $100,000. Providing a permanent new source of clean drinking water would have cost an estimated $11.8 million.

The U.S. Geological Survey estimates that more than 360,000 North Carolinians rely on private wells for drinking water in the 12-county area where shale gas supplies are suspected.

"More than half of Chatham County residents rely on private wells for their drinking water," said Sally Kost, Chatham County Commissioner. "As a county commissioner, I am concerned that as the drillers take their profits and leave North Carolina, the cost of the cleanup will be passed on to the Chatham County taxpayer."

Ten counties and cities in North Carolina have already passed resolutions and ordinances against fracking --ranging from outright bans to appeals to the NC General Assembly to proceed with caution.

"The town board is responsible for ensuring that the potable water it supplies to businesses and residents is plentiful and safe," said Mayor Randy Voller of Pittsboro. " Fracking is a variable that we can't account for. So until we're convinced it's safe, we oppose fracking in Pittsboro."

In addition to water cleanup costs, the report shows that fracking damage exacts other tolls that could fall to local communities to pay. For example:

Health: in Arkansas' Fayetteville Shale region, air pollution from fracking operations impose health costs estimated at $9.8 million in one year. In Texas' Barnett Shale region, those costs reach $270,000 per day during the summer smog season.

Emergency Response: A 2011 survey in eight Pennsylvania counties found that 911 calls had increased in seven of them, with the number of calls increasing in one county by 49 percent over three years, largely due to an increase in incidents involving heavy trucks. In North Dakota, highway crashes increased by 68 percent between 2006 and 2010, with an increased cost of $31 million.

In Granville County, Creedmoor Mayor Darryl Moss said fracking could cause his volunteer fire department to handle environmental incidents. aEuros¨aEuros¨"In terms of trying to figure out how to get them the equipment they need in order to respond to an environment they don't have to respond to today - we are looking at millions of dollars just on that piece of it alone," he said.

The Costs of Fracking report comes as the state's Mining and Energy Commission is beginning to develop recommendations on a range of regulatory issues, including impact fees and bonding. The Commission is also required by Senate Bill 820 to develop "uniform" rules that would prohibit local bans on fracking .

Environment North Carolina and the local officials gathered across from Raleigh's Municipal Building urged the General Assembly to maintain the state's moratorium on fracking along with local governments' authority to ban it.

"We already know about fracking 's damage to our environment and health. These dollars and cents costs

are one more reason to reject this dirty drilling practice," concluded Ouzts.

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Fracking Bill Becomes Law

Targeted News Service (USA) - Tuesday, November 27, 2012
RALEIGH, N.C., July 3 -- Environment North Carolina issued the following news release:

Without allowing any debate, house lawmakers used a parliamentary maneuver and an errant vote to override Governor Perdue's veto of a sweeping measure that paves the way for a controversial method of gas drilling called " fracking " as soon as 2014.

"Adopting sweeping fracking policy without adequate study is bad enough," said Elizabeth Ouzts, Environment North Carolina State Director. "Doing so with a tricky parliamentary maneuver and an accidental vote is shameful."

Proponents lacked the required three-fifths majority to override the veto, but Rep. Becky Carney, a Democrat from Mecklenburg County, pushed the wrong button and a "clincher" motion by Wake County Rep. Paul "Skip" Stam prevented her from changing it, giving the fracking measure a one-vote margin of victory.

Fracking , short for " hydraulic fracturing ," is the process by which water, sand, and toxic chemicals are injected into wells at high pressure in order to extract shale gas.

State laws currently prohibit two key aspects of the technology: horizontal drilling and injecting chemicals into the ground. Senate Bill 820 lifts those prohibitions and tasks a new, industry-influenced commission with developing rules that could allow the practice as soon as 2014.

A 484-page analysis from the state's environmental agency documents the extent to which fracking has contaminated water supplies and waterways around the country, and calls for seven additional studies, none of which are addressed by the bill.

Clean water advocates also criticized Rep. Susi Hamilton, Democrat of New Hanover County, who had signed a letter urging the governor to veto the fracking bill but voted for the veto override--ostensibly in return for additional incentives for the film industry.

"Rep. Hamilton's vote in favor of fracking was a real disappointment," said Ouzts.

TNS CT21CT-121128-4119355 61ChengTacorda

Joint effort to ban fracking

Warwick Advertiser, The (NY) - Tuesday, November 27, 2012
Something very important and positive is happening in Warwick and people should be aware of it.

The Conservation Board and Sustainable Warwick have joined forces to request that the Town Board enact a ban on hydraulic fracking and fracking -related activities throughout the Town.

We have jointly initiated this action for the following reasons:

• Because Warwick sits on the gas-rich Utica Shale, it is almost certain that without the ban, fracking will come to Warwick.

• Fracking is a heavily industrialized activity, totally at odds with both our Comprehensive Plan and the rural spirit of the Warwick community.

• In a town the size of Warwick, fracking would involve the use of hundreds of millions of gallons of water that would be drawn from mostly local sources and transported to the well sites by more than 100,000

heavy tanker truck trips spreading out over Warwick's local roads.

• That water - containing 1 to 2 percent chemical additives, many of which are toxic – is injected under extremely high pressure down into the wells to fracture the shale beds and release the trapped gas. Then the water is brought back to the surface ,more toxic than when it went down, and is either trucked back out – more trucks – or stored in open pits on the surface where leakage and evaporation can disperse the toxins into Warwick's air and water supply.

• The presence of this decades-long industrialized activity, with the truck traffic and the contamination hazard would be a direct threat to Warwick's economy built on agriculture and tourism.

• Homeowners will be affected because major banks are no longer issuing mortgages for land where fracking is taking place – or even land that is near a fracked well. Likewise, because of the dangers inherent in fracking , insurance companies are canceling homeowner policies.

For all these reasons, we are asking the Town Board to take action now and join with over 140 other New York State towns that have banned or restricted fracking .

We feel strongly that, with this request, we are speaking for most of Warwick.

Dan Duthie, chairman Warwick Conservation Board
Geoff Howard, chair Sustainable Warwick

MYRIAD FRACKING SECRETS KEEP AMERICANS CLUELESS ON WELLS

Pittsburgh Post-Gazette (PA) - Saturday, December 1, 2012
Author: Ben Elgin, Bloomberg News
A subsidiary of Nabors Industries Ltd. pumped a mixture of chemicals identified only as "EXP- F0173-11" into a half-dozen oil wells in rural Karnes County, Texas, in July.

Few people outside Nabors, the largest onshore drilling contractor by revenue, know exactly what's in that blend. This much is clear: One ingredient, an unidentified solvent, can cause damage to the kidney and liver, according to safety information about the product that Michigan state regulators have on file.

A year-old Texas law that requires drillers to disclose chemicals they pump underground during hydraulic fracturing , or " fracking ," was powerless to compel transparency for EXP- F0173-11. The solvent and several other ingredients in the product are considered a trade secret by Superior Well Services, the Nabors subsidiary. That means they're exempt from disclosure.

Drilling companies in Texas, the biggest oil-and-natural gas producing state, claimed similar exemptions about 19,000 times this year through August, according to their chemical-disclosure reports. Data from the documents were compiled by Pivot Upstream Group, a Houston-based firm that studies the energy industry, and analyzed by Bloomberg News. Nationwide, companies withheld 1 out of every 5 chemicals they used in fracking , a separate examination of a broader database shows.

Trade-secret exemptions block information on more than five ingredients for every well in Texas, undermining the statute's purpose of informing people about chemicals that are hauled through their communities and injected thousands of feet beneath their homes and farms, said Lon Burnam, a Democratic state representative and a co-author of the law.

"This disclosure bill has a hole big enough to drive a Mack truck through," Mr. Burnam said of the law, which he called "much compromised legislation."

Is it "meaningless because there are so many exemptions?" he said. "I'm afraid it may be."

The Texas disclosure bill marks a growing effort by the oil and gas industry to address public concerns about fracking , a drilling technique in which millions of gallons of water, sand and chemicals are pumped underground to free up more hydrocarbons. While the method has unlocked vast new sources of energy,

safety questions center on the hundreds of chemicals used -- many of them known carcinogens. The federal Environmental Protection Agency has little authority to regulate fracking ; Congress decided in 2005 that the bureau wouldn't oversee the practice.

The 2010 documentary film "Gasland" showed homeowners near fracked wells igniting the water that flowed from their faucets. A year later, the EPA linked fracking to contaminated drinking water in Pavillion, Wyo. The agency is retesting the Wyoming wells. A separate report from the U.S. Geological Survey this year confirmed the environmental agency's initial finding; it detected levels of methane, ethane, diesel compounds and phenol, which the EPA had identified in 2011.

Companies including Houston-based Halliburton Co. have embraced the Texas law as a model that "provides an enormous amount of information to the general public" while protecting trade secrets from competitors, said Susie McMichael, a company spokeswoman.

"Without such protection, companies would have no incentive to develop and put into use new technologies that are both environmentally beneficial and more effective," Ms. McMichael said in an email.

For neighbors of fracked wells, the omissions mean they can't use the disclosures to watch for frack fluids migrating into creeks, rivers and aquifers, because they don't know what to look for, says Adam Briggle, who is chairman of a citizen's group in Denton, Texas, called the Denton Stakeholder Drilling Advisory Group.

"We can't test to see what is coming into the environment," says Mr. Briggle, 35, who also works as an assistant professor of philosophy at the University of North Texas in Denton. "If frack fluids are so harmless, why do they hold onto these trade secrets so strongly?"

When Texas lawmakers were debating the disclosure bill, industry lobbyists made it clear that they wanted strong trade-secret protections, "but they didn't say it would be this heavily utilized," said Cyrus Reed, acting director of the Sierra Club's Lone Star chapter, who worked with companies to develop the rule. "It is disappointing to see this many trade secrets being claimed."

The law was signed by Gov. Rick Perry, a Republican, in June 2011.

Oil and gas companies are permitted to withhold disclosure of chemicals and their concentrations in any product that they claim to be a trade secret under the Texas law. Such claims can be challenged by state regulators and landowners of well sites or adjacent parcels.

Several other states that require disclosure of fracking chemicals -- including Louisiana, Montana, New Mexico and North Dakota -- also leave it up to energy companies to determine what chemicals can be labeled secrets.

Recently, more states are following the Texas model -- with an assist from industry. In December 2011, the American Legislative Exchange Council, a Washington-based public policy organization that brings together corporations and legislators to craft bills for states, adopted model legislation that is almost identical to the Texas rule.

The model bill was sponsored inside ALEC by Exxon Mobil Corp., which also advises the council from a seat on its "private enterprise board," according to ALEC documents obtained by Common Cause, a nonprofit in Washington.

So far, legislators in eight states have proposed bills based at least in part on the ALEC model, according to Todd Wynn, the director of the organization's task force on energy, environment and agriculture.

The main author of the Texas bill said other states will tailor the language to their needs.

"Can it be better, and should it be better?" said State Rep. Jim Keffer, a Republican. "Yes, and I think it

will be better. People are going to use this bill as a base and then make it fit their state's attitude or their industry."

His Democratic co-author disagreed. It would be "a horrible mistake" for other states to use the Texas bill as a blueprint, Mr. Burnam said.

"Texas state government has been a wholly owned subsidiary of national oil and gas interests for a century," he says. "Do not look at it for guidance on anything related to protecting public health and safety."

Stanford Geoscientist Cites Critical Need for Basic Research to Unleash Promising Energy Sources
Targeted News Service (USA) - Saturday, December 1, 2012
STANFORD, Calif., Nov. 30 -- Stanford University issued the following news release:

"There is a critical need for scientists to address basic questions that have hindered the development of emerging energy resources, including geothermal, wind, solar and natural gas, from underground shale formations," said Mark Zoback (https://pangea.stanford.edu/people/faculty/mark-zoback/), a professor of geophysics at Stanford University. "In this talk we present, from a university perspective, a few examples of fundamental research needs related to improved energy and resource recovery."

Zoback, an authority on shale gas development and hydraulic fracturing , served on the U.S. Secretary of Energy's Committee on Shale Gas Development. His remarks will be presented in collaboration with Jeff Tester (http://www.cbe.cornell.edu/~jwt/index.html), an expert on geothermal energy from Cornell University, and Murray Hitzman (http://econgeol.mines.edu/Murray-Hitzman), a leader in the study of "energy critical elements" from the Colorado School of Mines.

Enhanced geothermal systems

"One option for transitioning away from our current hydrocarbon-based energy system to non-carbon sources is geothermal energy - from both conventional hydrothermal resources and enhanced geothermal systems (http://www1.eere.energy.gov/geothermal/enhanced_geothermal_systems.html)," said Zoback, a senior fellow at the Precourt Institute for Energy at Stanford.

Unlike conventional geothermal power, which typically depends on heat from geysers and hot springs near the surface, enhanced geothermal technology has been touted as a major source of clean energy for much of the planet.

The idea is to pump water into a deep well at pressures strong enough to fracture hot granite and other high-temperature rock miles below the surface. These fractures enhance the permeability of the rock, allowing the water to circulate and become hot.

A second well delivers steam back to the surface. The steam is used to drive a turbine that produces electricity with virtually no greenhouse gas emissions. The steam eventually cools and is re-injected underground and recycled to the surface.

In 2006, Tester co-authored a major report (http://mitei.mit.edu/publications/reports-studies/future-geothermal-energy) on the subject, estimating that 2 percent of the enhanced geothermal resource available in the continental United States could deliver roughly 2,600 times more energy than the country consumes annually.

But enhanced geothermal systems have faced many roadblocks, including small earthquakes that are triggered by hydraulic fracturing . In 2005, an enhanced geothermal project in Basel, Switzerland, was halted when frightened citizens were shaken by a magnitude 3.4 earthquake. That event put a damper on other projects around the world.

Last year, Stanford graduate student Mark McClure (http://energyseminar.stanford.edu/node/467) developed a computer model to address the problem of induced seismicity.

Instead of injecting water all at once and letting the pressure build underground, McClure proposed reducing the injection rate over time so that the fracture would slip more slowly, thus lowering the seismicity. This novel technique, which received the 2011 best paper award from the journal Geophysics, has to be tested in the field.

Shale gas

Zoback also will also discuss challenges facing the emerging shale gas industry. "The shale gas revolution that has been under way in North America for the past few years has been of unprecedented scale and importance," he said. "As these resources are beginning to be developed globally, there is a critical need for fundamental research on such questions as how shale properties affect the success of hydraulic fracturing , and new methodologies that minimize the environmental impact of shale gas development."

Approximately 30,000 shale gas wells have already been drilled in North America, he added, yet fundamental challenges have kept the industry from maximizing its full potential. "The fact is that only 25 percent of the gas is produced, and 75 percent is left behind," he said. "We need to do a better job of producing the gas and at the same time protecting the environment."

Earlier this year, Zoback and McClure presented new evidence (http://www.mydigitalpublication.com/display_article.php?id=1191516) that in shale gas reservoirs with extremely low permeability, pervasive slow slip on pre-existing faults may be critical during hydraulic fracturing if it is to be effective in stimulating production.

Even more progress is required in extracting petroleum, Zoback added. "The recovery of oil is only around 5 percent, so we need to do more fundamental research on how to get more hydrocarbons out of the ground," he said. "By doing this better we'll actually drill fewer wells and have less environmental impact. That will benefit all of the companies and the entire nation."

Energy critical elements

Geology plays a surprising role in the development of renewable energy resources.

"It is not widely recognized that meeting domestic and worldwide energy needs with renewables, such as wind and solar, will be materials intensive," Zoback said. "However, elements like platinum and lithium will be needed in significant quantities, and a shortage of such 'energy critical elements' could significantly inhibit the adoption of these otherwise game-changing technologies."

Historically, energy critical elements have been controlled by limited distribution channels, he said. A 2009 study co-authored by Hitzman found that China produced 71 percent of the world's supply of germanium, an element used in many photovoltaic cells. Germanium is typically a byproduct of zinc extraction, and China is the world's leading zinc producer.

About 30 elements are considered energy critical, including neodymium, a key component of the magnets used in wind turbines and hybrid vehicles. In 2009, China also dominated the neodymium market.

"How these elements are used and where they're found are important issues, because the entire industrial world needs access to them," Zoback said. "Therefore, if we are to sustainably develop renewable energy technologies, it's imperative to better understand the geology, metallurgy and mining engineering of these critical mineral deposits."

Unfortunately, he added, there is no consensus among federal and state agencies, the global mining industry, the public or the U.S. academic community regarding the importance of economic geology in securing a sufficient supply of energy critical elements. Panel discussion

Immediately following the Dec. 4 AGU talk, Zoback will participate in a panel discussion at 5:35 p.m. on

the challenges and opportunities for energy and resource recovery. The panel will be led by Joseph Wang of the Lawrence Berkeley National Laboratory and will include William Brinkman of the U.S. Department of Energy's Office of Science; Marcia McNutt, director of the U.S. Geological Survey; and Jennifer Uhle of the U.S. Nuclear Regulatory Commission's Office of Nuclear Regulatory Research.

On Wednesday, Dec. 5, at 12:05 p.m., Zoback will deliver another talk on the risk of triggering small-to-moderate size earthquakes during carbon capture and storage.

Carbon capture technology is designed to reduce greenhouse gas emissions by capturing atmospheric carbon dioxide from industrial smokestacks and sequestering the CO2 in underground reservoirs or mineral deposits.

Zoback will outline several elements of a risk-based strategy for assessing the potential for accidentally inducing earthquakes in carbon dioxide reservoirs. The talk will be held in Room 2004, Moscone Center West.

Mark Shwartz writes about science and technology at the Precourt Institute for Energy at Stanford University.

By Mark Shwartz

Concerned Residents Ask Court to Immediately Release Names of Corporations Seeking to Frack On Public Lands Near Their Homes , Farms & Schools
Targeted News Service (USA) - Saturday, December 1, 2012
EUGENE, Ore., Nov. 30 -- The Western Environmental Law Center issued the following news release:

With just over 2 weeks remaining for the public to protest the plan to lease 20,000 acres of public lands surrounding the North Fork Valley to oil-and-gas developers, Citizens for a Healthy Community (CHC) and the Western Environmental Law Center (WELC) have asked a court to require the federal government to immediately release the names of the corporations that nominated these public lands for drilling. The groups filed a preliminary injunction late yesterday in the U.S. District Court for the District of Colorado seeking an expedited resolution to their ongoing Freedom of Information Act (FOIA) lawsuit, which the groups filed in June 2012. BLM's decision to lease the parcels in the February 2013 lease sale left the groups no choice but to seek the expedited ruling so that concerned residents would be able to acquire the requested information - information critical to their opportunity to fully participate in the public protest period regarding these oil-and-gas leases.

In December 2011, the Bureau of Land Management (BLM) announced that it intended to lease 30,000 acres of public lands surrounding Colorado's North Fork Valley at its August 2012 lease sale. So that local residents could learn more about the entities proposing such extensive development in and around their communities, CHC and WELC requested that BLM release the names of the entities that had nominated these lands for drilling, as they were likely to be the companies that would ultimately be drilling and fracking in the rural, agricultural community. BLM refused to reveal their identity, which led to the FOIA legal action.

In May 2012, following public outrage and the submission of nearly 3000 public comments, BLM deferred the lease sale to conduct additional analysis. On November 16, BLM released the additional, but still deficient, analysis and announced plans to lease almost 21,000 acres of public lands at its February 2013 lease sale, despite the ongoing FOIA litigation and the impending revision to the agency's decades old resource management plan for the area.

"Unfortunately, BLM is trying to pull a fast-one on the public by attempting to steamroll a lease sale through before the Court can decide whether the agency is required to disclose who is behind the nomination of these public lands for oil-and-gas development," said WELC Attorney Kyle Tisdel. "We are hopeful this matter can be resolved expeditiously so that we can re-focus our attention on protecting this community and its vital resources from the agency's irresponsible decision to lease these public lands without the hard look and public participation that the law requires."

"Members of our community suspected that the BLM would again try to lease these parcels in the North Fork Valley before the court had a chance to rule on its secretive nomination process," said Jim Ramey, Director of CHC. "We are hopeful that the Court will halt the agency's attempt at an end run and require that the public be allowed access to this crucial information prior to the close of the public protest period and to bring an end to BLM's covert lease nomination practice nationwide."

The legal action, which was filed in June 2012 under FOIA and the Administrative Procedure Act, aims not only to reveal the identity of the persons or entities that nominated pubic lands for inclusion in the North Fork lease sale, but also to put an end to BLM's general policy and practice of keeping the nominators' identity secret until after an oil and gas lease sale takes place.

Click here (
http://www.westernlaw.org/our-work/climate-energy/dirty-energy/lifting-veil-secrecy-oil-gas-leasing-public-lands) for more information on WELC's work to protect the North Fork Valley's farming communities and clean water from fracking .

Petroleum Council praises hydrofracking

Daily Mail, The (Catskill, NY) - Friday, November 30, 2012
Author: John Mason Hudson-Catskill Newspapers
GREENPORT — Permitting hydraulic fracturing in New York would be an economic boon for communities on the Southern Tier, a speaker told an audience of about 15 people Thursday at Congregation Anshe Emeth. But there would probably not be much impact in this area, she told Hudson-Catskill Newspapers.

Karen Moreau, the executive director of the New York State Petroleum Council, was the first of two speakers on the process popularly known as hydrofracking Anshe Emeth is sponsoring. Moreau, a Catskill native, presented the pro- fracking view; at 7 p.m. Thursday, educator and former Taghkanic Town Councilman Anthony LaSalvia will present the opposing view.

As described by Moreau, hydrofracking involves using a drilling rig, about 120 feet high, to drill 5,000 feet down vertically and then about another 5,000 feet horizontally. The drilling is done with a series of successively smaller drill bits. After each bit's work is completed, it is removed and a steel casing inserted, which seals off the well bore from the surrounding earth.

Next, the fracking crew comes in with a fleet of trucks containing a solution of water, sand and chemicals, "sort of like a milkshake," Moreau said. The horizontal pipe is punctured with fine holes, particularly at the far end. The solution is driven down into the pipe by big pumps and shoots through the holes into the shale, located 200 feet above and below the pipe.

The sand in the solution props open hairline cracks in the shale to allow the gas to escape. The fluid, now called "flowback," is reverse pumped out of the pipe, creating a vacuum, which the gas rushes into fill.

Hydraulic fracturing has been around a long time, Moreau said. The game changer that made the process economical for companies to harvest the gas, she said, was the development of horizontal drilling techniques.

Moreau became interested in hydrofracking because of her background in farming, she said. Her family owns the Bulich mushroom farm in Catskill. In a family of eight children, she said, "my father designated me to be the lawyer."

In 2001, she met some farmers from the Southern Tier, where the soils are much worse than in this area. A tough business in good times, she said, in those depressed times, dairy farming seemed hopeless.

"You could pick up a farm for $80,000," she said. "I didn't see any real hope."

Then in 2009, a friend took her around the area just over the border in Pennsylvania, where hydrofracking was already taking place.

She saw a lot of activity: businesses booming, new roads being built, help wanted signs everywhere.

“This could be a godsend for my friends,” she thought. She began investigating the issue, talking to people in the area, writing articles. There was plenty of media opposition to the process, she said; she was afraid this was hurting the chances for landowners to get back on their feet.

She ended up making a video to tell the story.

The video talks about how the Hudson River has an industrial history. In her childhood, the cement plants employed people and ensured prosperity.

“But the environmentalists did everything they could to shut down the cement plants,” says the voice on the film. “They want to see open fields, not cement plants. They don’t have to make a living up here.”

The mayor of Cobleskill said there are no jobs and home values are depressed. “There’s no industry here anymore,” he says in the film.

The film depicts a political divide in New York over the issue of hydrofracking , with landowning farmers unable to make a living because they are not allowed to lease their land to hydrofrackers.

Meanwhile, across the border, Pennsylvania farmers are fixing up their homes with the money they’re making from fracking . Some New York farmers are working for the Pennsylvania frackers, hauling water.

In Bradford County, Pa., says the movie, unemployment was cut from 10 percent to 5 percent.

Following the movie, Moreau gave a little more personal history. In January 2012, she became the executive director of the New York State Petroleum Council.

“I represent the large oil and gas companies,” she said. “But the companies most interested and engaged are Exxon and Shell.”

She then took questions from the audience.

Mark Leinung asked what happens to the fracking solution after it comes to the surface as flowback.

Moreau said it goes into a filtration system. “At the other end you get recycled water to be used in the next drilling operation,” she said. The effluent is transported to “places like Ohio, which has deep injection wells used for all kinds of waste.”

Leinung also asked about whether there could be groundwater contamination. Unlike the ocean, he said, “an aquifer cannot cleanse itself. You can understand how there might be concerns about the loss of an aquifer.”

Moreau said additional setbacks are required from private water wells.

As for the aquifers, “you’re not going to have drilling in a place where there’s an issue of a water source. … By properly constructing the well, you eliminate the contamination path.”

Asked what royalties were being paid to landowners, Moreau said she didn’t know, but heard they were getting $5,000 per acre signing fees and royalties of 18 to 20 percent.

Asked about the Utica Shale, she said it would be many years before you’d see it developed as an energy source.

There will not be much impact on either Columbia or Greene counties, she told Hudson-Catskill Newspapers. The Marcellus Shale goes only as far east as Delaware County and it’s the deepest and

therefore best for natural gas drilling on the Southern Tier.

“The only thing that I could hope over time would be the relocation of manufacturing,” she said. “Most manufacturing needs a low-cost source of fuel, for example, steel making. Companies are coming back to Pennsylvania because of the stable source of natural gas.”

Fracturing - Ex-official sees opportunity on water oversight

Houston Chronicle (TX) - Friday, November 30, 2012
Author: Emily Pickrell
Hydraulic fracturing provides state and federal regulators an opportunity to develop complementary roles in providing oversight of water use, a former federal water regulator said this week.

The states have a natural role in providing permits and specific regulations, while the federal government could provide a broader perspective on how energy and environmental concerns meet, Ben Grumbles, president of the U.S. Water Alliance and former assistant administrator for water at the Environmental Protection Agency, said at the Total Energy USA conference in Houston.

"There is a role for the federal government not just for providing science but for regulatory guidance on how you meet energy and environmental needs together," he said. "It is also a positive development that states are stepping up and developing more regulatory programs and oversight on fracturing operations."

Grumbles noted that many states, including Texas, Wyoming and Colorado, have increased disclosure requirements on chemicals used in water for hydraulic fracturing .

He anticipates the federal role in water regulatory oversight for hydraulic fracturing will focus more on research and education, but he notes that it also has a role in overseeing state programs that will likely remain.

Report: Methane released into airsame in fracking

Leader Times (Kittanning, PA) - Friday, November 30, 2012
Author: BLOOMBERG NEWS
Methane released into the air after a natural gas well is tapped by hydraulic fracturing is on par with traditional drilling procedures, researchers from the Massachusetts Institute of Technology said in a report.

The findings of MIT’s Francis O’Sullivan and Sergey Paltsev are at odds with estimates by Cornell University scientists, who concluded that natural gas produced by fracking can cause more global warming than burning coal.

Drilling companies have an economic interest in capturing the escaping gas, and in some states they are subject to regulations mandating that it be flared, not vented, the study concluded.

“When companies vent and flare methane they are losing gas that they could have captured and sold,” Paltsev, the assistant director for economic research at the MIT Joint Program on the Science and Policy of Global Change, said in a statement.

Methane, a greenhouse gas linked to global warming, is the main component of natural gas.

As the fracking process starts to free gas trapped in underground rock, some methane is released.

The amount released can offset the global-warming benefits of natural gas over coal, Cornell University researcher Robert Howarth said in a study published last year.

When it is burned to produce electricity, natural gas emits about half the carbon dioxide, the main greenhouse gas, as coal, according to the Environmental Protection Agency. Methane is a more potent greenhouse gas, although it dissipates from the atmosphere more quickly.

Flowback, venting

The MIT study estimated actual emissions from wells that are fracked, the process in which water, sand and chemicals are shot underground to free trapped gas. Right after a well is fracked there is an initial period, called flowback, when the gas can be vented into the atmosphere or flared off.

Howarth assumed that all the gas is vented, the MIT paper said. “This is an unreasonable assumption, not least because some producing states have regulation requiring flaring as a minimum gas handling measure,” Paltsev and O’Sullivan said in their paper.

As a result, they conclude that those initial emissions represent 0.4 percent to 0.6 percent of a well’s estimated ultimate recovery. Howarth said those emissions could be as much as 3.2 percent.

WATER; Leaders can't ignore state's water needs

San Antonio Express-News (TX) - Friday, November 30, 2012

Despite welcome rains this fall, most of Texas - including much of the San Antonio region - has returned at least to moderate drought conditions. Half the state, according to data from the National Drought Mitigation Center, faces severe, extreme or exceptional drought conditions.

These abnormally dry conditions are part of a longer-term climatological trend that extends back at least to 2010. And it is occurring as Texas is growing rapidly.

Texas was the nation's fastest growing state over the last decade, adding 4.3 million residents. According to the U.S. Census, that explosive growth is continuing into this decade.

Water shortages wouldn't merely be nuisances. They could devastate the state's $100 billion per year livestock and agricultural industries. They could also halt the growth of fracking and manufacturing, including the water-intensive production of computer chips and other high-tech industries. For urban and rural households, rationing and higher water bills could become a way of life.

The official State Water Plan released last summer calls for $53 billion in water infrastructure spending over the next 50 years. In an era of tight state budgets, no one seems to know where that money might be found. Few have had much interest in finding it.

A growing coalition, however, grasps the urgency of the water infrastructure situation. H204Texas is a nonprofit advocacy group made up of agricultural, business, environmental and utility organizations that are “committed to mobilizing public support for implementation of the Texas State Water Plan.”

In Austin, the group has a sympathetic ear in House Speaker Joe Straus, who has listed water infrastructure among his priorities. Gov. Rick Perry, however, has provided little leadership on the issue.

Water infrastructure has traditionally taken a back seat to the more obvious needs of a growing state - transportation, education and even law enforcement. Texas hasn't made a significant investment in water resources in decades. But the combined effects of the long-term drought and a fast-growing population should make clear that the state's water infrastructure needs can no longer be ignored.

FRACKING IN MICHIGAN: UNIVERSITY OF MICHIGAN RESEARCHERS STUDY POTENTIAL IMPACT ON HEALTH, ENVIRONMENT, ECONOMY

US Fed News (USA) - Friday, November 30, 2012

ANN ARBOR, Mich., Nov. 28 -- The University of Michigan issued the following news release:

University of Michigan researchers are conducting a detailed study of the potential environmental and societal effects of hydraulic fracturing , the controversial natural gas drilling process known as fracking .

In hydraulic fracturing , large amounts of water, sand and chemicals are injected deep underground to break apart rock and free trapped natural gas. Though the process has been used for decades, recent technical advances have helped unlock vast stores of previously inaccessible natural gas, resulting in a

fracking boom.

Now U-M researchers are working with government regulators, oil and gas industry representatives and environmental groups to explore seven critical areas related to the use of hydraulic fracturing in Michigan: human health, the environment and ecology, economics, technology, public perception, law and policy, and geology/hydrodynamics.

Detailed technical reports on the seven subject areas are to be released early next year for public comment.

"While there have been numerous scientific studies about hydraulic fracturing in the United States, none have been conducted with a focus on Michigan," said John Callewaert, director of integrated assessment at U-M's Graham Sustainability Institute, which is overseeing the study.

The research teams kicked off the first phase of their two-year research project last month with support from four university units: the Graham Sustainability Institute, the Erb Institute for Global Sustainable Enterprise, the Energy Institute and the Risk Science Center. Industry representatives, nongovernmental organizations, state government officials, academic experts and other stakeholders are providing input.

During a policy address on energy and the environment today at Michigan State University's W.K. Kellogg Biological Station, Gov. Rick Snyder noted that the state will be a partner in the U-M-led fracking study.

"We're going to be a partner with the University of Michigan's Graham Sustainability Institute on doing a study on where fracking 's going," Snyder said. " Fracking is something that is very serious and it needs to be done the right way.

"Let's be at the forefront of being environmentally responsible when we look at these energy issues. And let's do this in a way where we're working together."

The U-M-led research teams will draw on their findings for the second phase of the project, which will outline a range of environmental, economic, social and technological approaches to assist stakeholders in shaping hydraulic fracturing policies and practices in Michigan. The researchers will present their overall findings and policy recommendations in 2014.

Of particular interest is the increasing use of horizontal drilling , whereby drilling is conducted horizontally to expose the drill bore to more shale rock formation. In those cases where shale fracturing is required, water with added chemicals is injected into the reservoir rock at high pressure to cause the rock to fracture and open up for gas extraction.

" Hydraulic fracturing has been around for decades, but with horizontal drilling now coming into play, people are increasingly questioning and scrutinizing the risks involved," said Andrew Maynard, professor of environmental health sciences and director of U-M's Risk Science Center.

"Areas of concern include perceived lack of transparency, potential chemical contamination, water availability, waste water disposal, and impacts on ecosystems, human health and surrounding areas."

Callewaert said there are currently only a small number of active drilling sites in Michigan that use high-volume horizontal drilling in conjunction with hydraulic fracturing .

"There's a lot of interest, but there really isn't that much activity at the moment in Michigan," he said. "That's why this is a good time to do the assessment."

One of the stakeholders engaged in the project is Tip of the Mitt Watershed Council, an environmental nonprofit organization in northern Michigan near the Antrim Shale Formation, which stretches through six counties across the top of Michigan's Lower Peninsula, from Lake Michigan on the west to Lake Huron on the east.

"What concerns us is the application of horizontal hydraulic fracturing ," said Tip of the Mitt Program Director Grenetta Thomassey, who sits on the project steering committee. "We are very glad to be working with the University of Michigan and the Graham Institute in taking a proactive, multidisciplinary look at the impacts and implications of this practice, and what to do about them, both now and in the long run."

The two-year study uses a collaborative research methodology called integrated assessment, which, according to Callewaert, is ideally suited for addressing complex sustainability challenges.

"There are many different perspectives on hydraulic fracturing ," Callewaert said. "But, fortunately, we've been able to draw together some exceptional researchers across multiple disciplines at U-M, as well as several key stakeholders, in order to conduct a thorough, unbiased assessment to help determine what new approaches might be needed for Michigan."

Greg Fogle, a 40-year oil and gas industry veteran, is a representative of the Michigan Oil and Gas Association, a stakeholder in the project.

"MOGA is proud of the industry's record of conducting hydraulic fracturing safely and without environmental incident since 1948," Fogle said. "We believe this project will demonstrate how Michigan is a national model when it comes to regulating hydraulic fracturing and ensuring proper safeguards for keeping water, air and land protected."

John DeVries, a U-M Law School graduate and a steering committee member specializing in oil and gas law, emphasized the importance of a multifaceted investigation.

"This unbiased, science-based study will investigate not only the potential environmental risks of hydraulic fracturing but also the potential air quality and economic benefits of using the domestic, low-cost natural gas produced by hydraulic fracturing for electrical generation and manufacturing," DeVries said.

Erb Institute Director Andrew Hoffman is one of the researchers working on the social issues and public perception report.

" Hydraulic fracturing has the potential to touch issues that virtually all Michigan residents care about: drinking water, air quality, Great Lakes health, water supply, local land use, energy security, economic growth, tourism and natural resource protection," Hoffman said. "In the end, our goal is to provide valuable insights and information to help address these important and legitimate concerns here in the Great Lakes State."

In addition to the Tip of the Mitt Watershed Council and MOGA, other stakeholders and organizations engaged in the " Hydraulic Fracturing in Michigan Integrated Assessment" include the Michigan governor's office, the Michigan Department of Environmental Quality and the Michigan Environmental Council.

U-M researchers include: Nil Basu, School of Public Health; Allen Burton, School of Natural Resources and Environment; Knute Nadelhoffer, Department of Ecology and Evolutionary Biology; Rolland Zullo, Institute for Research on Labor, Employment, and the Economy; Johannes Schwank, Department of Chemical Engineering; John Wilson, U-M Energy Institute; Kim Wolske and Andrew Hoffman, the Erb Institute; Sara Gosman, Law School; and Brian Ellis, Department of Civil and Environmental Engineering.

As part of the investigation, research teams are soliciting input from the public through an online comment form on the Graham Institute website. To learn more about the study or to provide input via the online comment tool, visit the "Problem Solving" section of the Graham Institute website at http://www.graham.umich.edu/ia/ hydraulic-fracturing .php or contact John Callewaert at (734) 615-3752 or jcallew@umich.eduThis email address is being protected from spambots. You need JavaScript enabled to view it.

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HAMILTON: Ecology, fracking , economy and water bills in the balance

Niagara Gazette (Niagara Falls, NY) - Thursday, November 29, 2012
Author: Ken Hamilton, Niagara Gazette

Niagara Gazette — Coming out of Scranton, Pa., and on page 8A of Monday's Gazette was the story "Natural gas drillers target the truck and bus market." The very interesting article included information concerning not only drilling, but also on the controversial technique of so doing called fracking ; and energy production, the environment and the economy should be of a particularly balanced concern to all Niagarans.

Why? Because dispersed throughout many other editions of the paper are articles on the tax increases that the residents and businesses of Niagara Falls are facing — a 3.7 percent at the county level, a 6 percent increase for water and sewer, 8.3 percent at the city level, a potential tax increase for education and schools — and who knows how the state is going to finance the SOS recovery from Superstorm Sandy?

Given all of these factors, then any frack water treatment in the city would merely be lost amongst all of the other deep doo in which we will fiscally find ourselves drowning. And drowning we are, so we have to do something in those same terms of what former House of Representative Speaker Tip O'Neill often said: "All politics are local."

After all, life is about balance, balance in all things. And I cannot help but to think that when all factors are equal that we would take the one that would most benefit ourselves; and I will let you come to your own conclusions on that. Without laying out the facts themselves, I will describe, and maybe define the factors.

There are those who think that fracking and frack water processing is absolutely and inherently dangerous, and that it cannot be made safe under any conditions; and those people "may" be right. I just don't agree with very many "absolutes" in life, particularly given the technological progress that we all have seen, even in our own lives.

Couple that with my personal experiences of working in the electrochemical industry within the city itself, and understanding that highly toxic substances can be manufactured, handled and safely shipped, if given the proper regulation, technical expertise, engineering and administrative acumen that is necessary to so do.

While that technology for fracking and frack water treatment may not adequately exist today, I find it difficult to believe that it will not be so when it becomes a commitment to get it done.

The ecological sector says that fracking will destroy the environment. Again, balance. If we don't get natural gas out of the ground, then in order for America to be energy independent, as the president says that he wants it to be, then we will have to burn coal in order to make that happen; and through demanded technology, even the air quality associated with such burning has dramatically improved; however, nowhere close to the clean-burning natural gas that fracking produces. And while frack water treatment in Niagara Falls, given the proper technology, will be non-contact with the city's drinking water supply, we all breathe the air that coal-burning produces; even coal-burning that is hundreds of miles from us. Are these ecologist balancing out fracking and coal-burning on the scales of "all things equal, but this part is closest to me" as we should?

Probably. But one of the factors that we must look at, in Niagara Falls, is that we are a tourist city; and has our mayor not said that we must continuously develop that sector of our economy? It would appear that we must do that now more than ever.

Ironically, virtually all of our tourists arrive here as a result of the price of energy. As the AP article pointed

out, and I quote, "... the drilling boom, spurred by the new technology that unlocked vast reserves of natural gas in deep rock formations like the Marcellus Shale underneath parts of New York, Pennsylvania, West Virginia and Ohio – created a gas glut that depressed prices. That, in turn has made natural gas more attractive as a transportation fuel." And I cannot help but to think how that can only help us, as O'Neill pointed out, locally.

Again, Rubinkam's comments, "If the trash truck or bus rolling down your street seems a little quieter these days, you're not imagining things. It's probably running on natural gas."

Perhaps we should take a 'wait and see' stance on the issue; and by so doing, perhaps we will one day see more of those buses here, but with out of town license plates.

TECHNOLOGY OPENS MISSISSIPPI LIME TO FURTHER DEVELOPMENT - Northern Oklahoma oil field shows growing potential
Oklahoman, The (Oklahoma City, OK) - Thursday, November 29, 2012
Author: ADAM WILMOTH, Energy Editor
What began less than five years ago as a small oil field in northern Oklahoma has now grown into one of the largest and greatest-potential oil fields in the country, according to participants at the 2012 Mississippi Lime Congress in Oklahoma City this week.

"This play is huge," said Julie Garvin, president of Houston-based Roxanna Oil Co. "If you think about all the potential extension, I've come up with about 20 million acres' potential."

Today, the Mississippi Lime play is believed to stretch from northwestern Oklahoma to Osage County and as far south as Logan County. Drilling activity is ongoing throughout much of western Kansas and into some parts of southwestern Nebraska.

Oil and natural gas producers have drilled through and around the Mississippi Lime for more than 100 years, but like many dense rock layers throughout the country, horizontal drilling and hydraulic fracturing have allowed producers to economically recover from rock that previously was not seen as profitable.

The first modern horizontal wells targeting the Mississippi Lime were drilled about five years ago. Drilling activity in the area picked up significantly in 2010.

Oklahoma City-based SandRidge Energy Inc. is the largest player in the field. Other large independent producers, including Oklahoma City-based Devon Energy Corp. and Chesapeake Energy Corp., also are active in the area.

The sprawling Mississippi Lime also supports many smaller operators.

"Because of the vast acreage, it has given opportunities for a lot of companies of different sizes to participate," said Earl Reynolds, chief operating officer and executive vice president at Oklahoma City-based Chaparral Energy Inc.

Chaparral primarily uses water flooding and carbon dioxide injections to recover additional oil from several of the state's oldest oil fields, including one in Osage County, where the company controls about 130,000 acres of leasehold.

After seeing the success of SandRidge and others in the area, Chaparral has drilled six test wells into the Mississippi Lime, which lies beneath the rocks it is currently producing.

"It is a very significant play that will be a material driver for growth in the U.S. for some time," said Reynolds

Increased drilling in northern Oklahoma is part of an ongoing oil boom in the state.

Drilling activity in the Cana Woodford formation in Western Oklahoma has led to renewed growth in Elk

City and other communities.

Oklahoma City-based Continental Resources this fall announced that it is focusing much of its future drilling in what it calls the South Central Oklahoma Oil Province, or SCOOP, which stretches from Chickasha to Ardmore.

The Mississippi Lime has attracted producers because it is relatively thick and shallow, both of which can make drilling less expensive.

One challenge, however, is that the rock itself is highly variable, so one well may be a success while another nearby may not. Also, most of the rural drilling sites are in areas with limited or no access to electricity, natural gas pipelines and other infrastructure.

While producers are still working to address some of the more technical challenges, they are hopeful the field's success will continue.

"The Mississippi play is viewed as a - if not the - prime economic driver of the Oklahoma economy for the next several years," said Bob Sullivan, a third-generation oilman and owner of Tulsa-based Sullivan and Co. "I'm counting on it to serve a fourth generation of Sullivans as well."

EN. BROWN ANNOUNCES NEW RESOURCES FOR PROJECTS TO ADVANCE SUSTAINABLE SHALE DEVELOPMENT PRACTICES

US Fed News (USA) - Thursday, November 29, 2012
WASHINGTON, Nov. 28 -- The office of Sen. Sherrod Brown has issued the following news release:

Two Ohio research institutions will receive resources for projects to advance sustainable shale development practices. Ohio University in Athens and Battelle Memorial Institute in Columbus will use U.S. Department of Energy (DOE) resources to address potential issues while reducing the environmental impact of shale development.

"Our state has already seen how increased development in the Marcellus and Utica shale has boosted Ohio's steel and chemical industry, created jobs, and provided a cleaner burning fuel source," Brown said. "But we must ensure that our air and water is protected for current and future generations. This research at Battelle and OU will advance these goals by improving safety and minimizing any negative environmental impact from shale development."

To qualify for funding, the DOE's Research Partnership to Secure Energy for America (RPSEA) requires projects to achieve one of the following ends related to shale development:

(1) Reduced risks of environmental impacts;

(2) Improved water handling and treating methods;

(3) Enhanced characterization of shales; and

(4) Improved understanding of the hydraulic fracturing process.

Ohio is one of eight states that is home to organizations receiving funding. Below are details of Ohio's awards.

Ohio University

Project name: Cost-Effective Treatment of Flowback and Produced Waters via an Integrated Precipitative Supercritical (IPSC) Process.

Funding: DOE share- $1,936,630; Recipient share- $500,160;

Duration: 2 years

Description: According to DOE, OU will evaluate the performance and cost-effectiveness of the IPSC process to convert fracture flowback and produced water generated by unconventional shale gas wells into a clean water product. This technology combines ultraviolet light treatment, chemical precipitation, and an advanced supercritical reactor incorporating a hydrocarbon reforming catalyst.

Battelle Memorial Institute

Project name: Development of Subsurface Brine Disposal Framework in the Northern Appalachian Basin

Funding: DOE share- $1,569,592; Recipient share- $402,732

Duration: 2 years

Description: According to DOE, Battelle will address the need for subsurface brine disposal options in the Ohio and neighboring states by compiling geological and reservoir data, developing geocellular models from logs and seismic data, and carrying out advanced reservoir and geomechanical simulations to better understand the geologic setting, reservoir dynamics, geomechanical issues, and subsurface effects of brine disposal. This research will result in maps, geologic cross sections, an inventory of reservoir parameters, and practical guidance for injection operations.

Light On Liquid For Fracking Boom ?

Repository, The (Canton, OH) - Wednesday, November 28, 2012
Author: Spencer Hunt; The Columbus Dispatch
CARROLLTON A deep, constant hum emanates from John and Elizabeth Neider's dairy and sheep farm.

Depending on whom you ask, it is either the sound of progress or a harbinger of environmental disaster.

The hum is created by a cluster of powerful pumps forcing millions of gallons of water, sand and chemicals into six deep wells. As much as 5 million gallons of water per well are needed to shatter the Utica shale and release the natural gas and oil trapped thousands of feet underground.

It is a process that is likely to be repeated in eastern Ohio thousands of times over the next few years, and Carroll County residents will have front-row seats.

The state has issued permits to drill as many as 161 wells in Carroll County. It is the most-concentrated cluster of such wells on a growing list of permitted well sites that cover 21 counties. If every well is drilled in Carroll County, companies will use as much as 805 million gallons of water to free the oil and gas. Across Ohio, as many as 2, 250 Utica wells could be drilled by the end of 2015, according to state estimates.

Critics say that drilling and " fracking " pose a pollution threat to streams and ground-water. Industry officials say the process is safe. As that debate continues, the industry's water consumption has grown into an issue of its own.

The change alone in Carroll County is huge. A Dispatch analysis of state water-use records shows that the county's mineral-extraction industry, which includes drilling, used 3.5 million gallons of water in 2010.

That year, Carroll County residents, farms and businesses drew 378.7 million gallons of water from the ground, lakes and streams.

Where will these companies get the water they need?

"I told them we were dry this spring," John Neider said about a conversation he had with the drilling company when it considered using his creek for fracking water. "Our creek is pretty much dry. Drilling-industry and state officials insist there's plenty of water for everybody."

"There's 30 trillion gallons of precipitation that falls on Ohio each year," said Heidi Hetzel-Evans, a spokeswoman for the Ohio Department of Natural Resources.

Most heavy industries that need water, including power companies, locate their plants and mills next to large lakes and rivers. That's not an option for the drilling industry.

Companies must get their water from wells or other water sources and either pump it to drilling sites in pipelines or drive it there in tanker trucks.

An analysis of state ground-water maps shows that the aquifers in 12 counties in the Utica shale region produce a maximum of 5 gallons of water per minute. That's enough to supply a single house.

With the possibility of drilling more than 2, 000 wells in the next three years, drilling companies are increasingly signing contracts with counties, cities, townships and regional agencies to draw water from public reservoirs and lakes.

A FLOOD OF REQUESTS.

At least a dozen oil and gas companies have filed requests with the Muskingum Water-shed Conservancy District to buy water from six reservoirs in eastern Ohio.

Officials delayed plans to begin selling water for fracking after residents objected earlier this year. They are now awaiting a U.S. Geological Survey study of the Atwood, Leesville and Clendening reservoirs to determine how much water can be sold off without harming the environment or recreation.

"We expect something by the end of the year," said Sean Logan, the district's conservation chief.

In September, however, the district board approved selling water for fracking from its Piedmont and Clendening reservoirs during their fall drawdown stage.

The drawdown releases more than 6 billion gallons of water from both lakes to increase storage capacity for thawed snow and ice during winter months. Officials said the amount of water oil and gas companies need for drilling is a small fraction of the drawdown.

The district's plans face strong vocal opposition from the Southeast Ohio Alliance to Save Our Water, an advocacy group.

"We can see that from some of the conversations that (district officials have) had that they are just looking for reasons to justify what it is they want to do," said Leatra Harper the group's leader. "We have hydrologists who say they don't understand the concept of excess water."

COWS, CROPS, WELLS.

While government groups are debating water sales, oil and gas companies are signing agreements with private landowners to buy access to their wells and ponds.

Since January 2011, shale-drilling companies and fracking contractors have registered at least 62 water withdrawals in 16 counties.

State law requires companies to register with the state if they intend to take more than 100, 000 gallons a day from a pond or stream in the Ohio River basin. Companies that take at least 2 million gallons a day must get a state permit.

In Carroll County, the fracking operation at the Neiders' farm is fed by a pipeline that snakes north for miles across several properties to a reservoir on another farm. A well there helps supply the reservoir.

The drilling company, Chesapeake Energy, says a lake on yet another farm also provides water for its fracking operation there.

"They paid us so much a foot for laying it on top of the ground," John Neider said of the pipeline. "It's supposed to be temporary."

Paul Feezel, the leader of a group called Carroll Concerned Citizens, said he fears that these companies could drain water that farmers use for drinking and livestock. He mentioned the Chesapeake water well as a potential threat.

Chesapeake Energy responded with a written statement that said the well provided, at most, one-tenth of the water used at the Neiders' farm.

The company says it also works with government agencies to ensure that water use for deep-shale gas development is consistent with water-use plans and does not adversely affect other users.

WHAT ABOUT DROUGHTS?

Feezel said he's also concerned about the fracking industry's impact on streams, especially during typically dry summer months and droughts.

He said that state regulations don't offer strong protections.

"Ohio doesn't stop people from taking more. It just asks them to report on where they are taking the water," he said. "If someone upstream says, 'Sure, you can have all this water,' and they pump a creek dry, it will be interesting to see what happens downstream."

Mike Hallfrisch, the water inventory and planning supervisor with the Ohio Department of Natural Resources, said the law entitles landowners to a "reasonable" use of water that runs across their land. It doesn't allow any one landowner to take all of the water.

"If (companies) damage someone downstream, they can be sued," Hallfrisch said.

A Greener Shade of Shale - Natural gas producers turn to "green completion" to capture emissions.
Philadelphia Inquirer, The (PA) - Sunday, November 25, 2012
Author: Andrew Maykuth INQUIRER STAFF WRITER
The towering flares that turn night into day in the Marcellus Shale gaslands are becoming an increasingly rare sight.

Natural gas producers are turning to new techniques to capture the gas emitted during the well-completion process. In the past, a well's initial production was typically vented or burned off to allow impurities to clear before the well was tied into a pipeline.

Now, more operators are employing reduced-emission completions - a "green completion" - a process in which impurities such as sand, drilling debris, and fluids from hydraulic fracturing are filtered out and the gas is sold, not wasted.

The five gas wells that EQT Corp. completed last month at this remote site in Greene County's Washington Township are typical. Compared to a gas flare, which roars like a jet engine and licks the sky with flame like a giant welder's torch, green completion is dull and quiet.

EQT is not the only drilling company that has embraced green completions. The equipment for separating the gas from the "flowback" has been perfected over the last decade and in the next three years, using it will become standard practice across the nation.

The U.S. Environmental Protection Agency approved new rules this year requiring green completions nationwide by 2015, except for exploratory wells unconnected to pipelines. As of Oct. 15, drillers can no longer vent the gas into the atmosphere without burning.

The EPA says green completions will save drillers up to $19 million a year by capturing natural gas that would be wasted.

The advent of green completions is an example of the rapid development of shale-gas technology, which has revived a flagging domestic energy sector in just a few years.

"What was true yesterday is no longer true today," said Andrew Place, director of public policy research at EQT, based in Pittsburgh. "Systems are evolving."

Easing concerns

Much of the new technology has been driven to address fears about drilling, including hydraulic fracturing , the extraction technique that has turned impermeable shale into a bonanza of oil and gas.

"Public concerns have pushed the engineers to come up with solutions," Place said.

Activists and regulators are paying more attention to air emissions from shale-gas development, including toxins emitted during drilling and production. Much of the focus has been on releases of methane, the main component of natural gas as well as a potent greenhouse gas, though there is substantial disagreement over studies attempting to measure the methane leaks.

In devising the new rules, the EPA said it was acting under its Clean Air Act mandate to reduce emissions of volatile organic compounds and pollutants such as benzene, which can cause cancer. The agency said the new rules were expected to eliminate 95 percent of the smog-forming volatile organic compounds emitted from more than 13,000 new gas wells each year.

The EPA said a "co-benefit" of green completions was a reduction in methane emissions by 1 million to 1.7 million tons a year.

The government delayed full implementation of the rule until 2015 to allow the industry to build enough equipment to handle the workload.

The American Petroleum Institute and other industry groups are challenging the new rules in the U.S. Court of Appeals in Washington. So are environmental groups.

"We'd say the rules have not gone far enough," said Jay Duffy, a staff attorney with Philadelphia's Clean Air Council, which joined with Earthjustice last month to notify the EPA it planned to sue.

Duffy praised the EPA for taking action to curb toxic emissions from drilling, but he contends the federal agency failed to directly confront the climate-change issue. The EPA concluded in 2009 that greenhouse gases endangered public health and welfare, but it has not devised standards on methane emissions.

Dealing with methane

Anti-drilling activists argue that so much methane escapes from gas development it undermines the industry's claims about the clean-air benefits of the shale-gas boom.

The industry says environmentalists and the EPA are using inflated, biased estimates of methane emissions. It has denounced as hoaxes some of the infrared videos posted online that purport to show methane plumes.

Some industry leaders say the biggest benefit to green-completion technology is that they hope it puts the

emissions controversy to rest.

"I do think it addresses a criticism that the industry has had in terms of methane emissions, and maybe we can take that off the table," Jack P. Williams Jr., president of XTO Energy, said in a recent interview.

EQT differs from many gas-exploration companies because it also serves a retail customer base through its gas utility in southwestern Pennsylvania, Equitable Gas Co. It says green completions achieve a significant emission reduction.

"EQT has an interest in minimizing our impact, our air impact in this case, in the basin where we have a social license to operate," said Place, a deputy secretary of the Pennsylvania Department of Environmental Protection before he went to work for EQT.

"We've been here for 120 years," he said. "We live in this community."

New protocols

At EQT's drilling site on Pettit Run Road in rolling farmland about seven miles northwest of Waynesburg, workers explained the kind of assembly-line drilling operation they have devised that now incorporates green completions.

Before EQT began drilling on this five-acre site carved out of a hillside, the company first extended its pipeline network to the location so it would be ready to receive any gas produced, said Michael Rehl, manager of completion operations.

During the spring, the five wells were drilled in a row, 15 feet apart, to a depth of about 7,500 feet, where they turn horizontally into the Marcellus Shale layer and follow parallel paths, separated by about 1,000 feet. Then the wells were lined with several layers of steel pipe and concrete, and hydraulically fractured.

The completion process commenced last month when a contractor, Pure Energy Services Ltd., began cleaning out wells one at a time.

At the outset, a well disgorges mostly sand, water, and chemicals used during the fracking process, along with drilling debris and minerals such as barium and manganese picked up from the shale formation. After about four days, the well produces mostly natural gas.

During a green completion, the mixture is routed through a series of filters. A cylindrical sand trap collects the solid materials, which are sent to a landfill. The water, containing the chemicals and mineral contaminants, is treated and stored for reuse in the next drilling operation.

And the natural gas is channeled into a pipeline and sent off to market, rather than being flared into the sky to achieve no other purpose than to heat the planet.

Contact Andrew Maykuth at 215-854-2947, amaykuth@phillynews.com. or follow @Maykuth on Twitter.

Pittsburgh energy company EQT talks about what it is doing to remove emissions at Marcellus Shale drilling sites. Watch a video at philly.com/business.
Caption: PHOTO AND MAP EQT's Andrew Place says:"Public concerns have pushed the engineers to come up with solutions." A "green completion" system at an EQT Corp. drilling site. The process captures gas that once would have been burned. MICHAEL S. WIRTZ / Staff MAP Sycamore, Pa. (The Philadelphia Inquirer)

The background behind the Bakken

Grand Forks Herald (ND) - Saturday, November 24, 2012
Author: Amy Dalrymple; Forum Communications
TIOGA, N.D. - Lorin Bakken recalls it was 2007 when he began seeing his name in the newspaper and on TV frequently as the oil boom started to heat up.

Since then, his family name has become synonymous with oil and opportunity.

"I feel so honored," Lorin said in a rare interview.

Lorin is the only son of Henry O. Bakken. The Bakken formation - the pool of oil that lies beneath western North Dakota, northeast Montana and part of Canada - is named for the well drilled in 1951 and 1952 on the Henry O. Bakken farm northeast of Tioga.

While Lorin Bakken, 59, says he feels honored, he avoids the attention he could easily draw to himself. He still lives in Tioga, but he keeps such a low profile that many people don't know he's connected to the Bakken boom.

He lives in a modest house, doesn't own a car and hasn't worked since he stopped working on his family's farm in 1992. He primarily keeps to himself, although he regularly attends Zion Lutheran Church, eats lunch twice a week at the senior center and does errands in downtown Tioga.

Lorin said he was private before his name became famous, and he hasn't changed.

Kathy Neset, a geologist who has been working in Tioga since 1979 and regularly gives talks on the Bakken formation, has never met Lorin, even though her farm is about 2 miles north of his family homestead.

"What a treasure we have here, to know we have a family member right here," Neset said.

Neset said it's fitting that North Dakota's famous formation would be named for a quiet, private family.

"It speaks to the culture of North Dakota. People are very reserved, they're not going to be speaking out on their wealth or the naming of the formation for them," Neset said. "I admire that trait and that quality and the good Scandinavian heritage here."

First Iverson.

The date of North Dakota's first oil discovery is considered April 4, 1951, at the Clarence Iverson farm near Tioga, according to "Mud, Sweat and Oil," a book about North Dakota's first year of oil written by journalist and historian Bill Shemorry.

Shemorry's photo of the Clarence Iverson No. 1 well became famous, and the site is home to a historical marker.

The Clarence Iverson well produced from the Silurian, Duperow and Madison formations, but not the Bakken, Neset said. There are several oil-producing formations at different depths within the larger Williston Basin.

"The Clarence Iverson takes the nod because it was the first oil discovered," Neset said. "It's really the well that put the 1950s boom on the map."

But another oil strike near Tioga - aptly known as the oil capital of North Dakota - would put the state on the map decades later.

The Amerada Petroleum Co. began drilling the Henry O. Bakken well on July 13, 1951, and first encountered oil on Sept. 5 of that year, according to a program for an oil strike celebration the family held weeks later.

Production didn't begin on the well until April 1952, according to the North Dakota Industrial Commission. Today, Bakken wells are drilled in less than a month.

"Back in those days, that was a huge undertaking, drilling to that depth," Neset said.

The Henry O. Bakken well produced a total of 255, 526 barrels of oil, which is a significant amount for a well that was drilled vertically, Neset said. She believes they must have encountered a naturally occurring fracture in the rock layer to get that much production.

The Bakken formation frustrated geologists for years because they knew the oil was there but they didn't have the technology to extract the oil, said Neset.

"The Henry O. Bakken well didn't really get its just excitement until we came back and made the Bakken economically successful with horizontal drilling and fracture stimulation," Neset said.

Hydraulic fracturing , or fracking , uses water, sand and chemicals to stimulate or create fractures in the rock to help extract the oil.

Cause for celebration.

Lorin, who was born in 1953, said he recalls his family talking more about the celebration than about the oil strike itself.

A program for the celebration that is in the Norseman Museum in Tioga shows that Henry Bakken hosted a free barbecue with several family members and neighbors to celebrate the oil strike, with performances by the school band and a vocalist. A freewill offering was collected to benefit the new nursing home building.

That first well is often called the H.O. Bakken well, but is known in the Industrial Commission records as Henry O. Bakken.

Lorin said both his father, Henry, and uncle, Harry, had the same initials and were equal partners in the farm, so he considers the well to be named for both of them.

Their brothers, Ludvig, Otto and Oscar, owned adjoining farms at the time of the oil celebration, according to the program.

Norwegian roots.

Lorin is the grandson of Norwegian immigrants Otto and Mary Bakken, who were married near Granite Falls, Minn., according to Otto's obituary.

Henry Bakken, Lorin's father, was born March 25, 1901, in Maynard, Minn.

Harry Bakken was two years younger than Henry, born March 15, 1903.

The "Wonder of Williams," a book by the Williams County Historical Society, says this about the Otto and Mary Bakken family:

"They had 13 children and lived in Thief River Falls, but their farm was too small and land prices were too high to provide a living for their family.

In 1907, Otto and Mary moved to North Dakota with eight of their children. Otto's brother, Carl Bakken, was a land locator and helped him find land northeast of Tioga. For a time, the Bakkens lived in a two-room house owned by Carl.

"When Henry gets started, he likes to talk and sometimes he doesn't know when to stop," says the description of Henry in the "Wonder of Williams" book.

Harry married Mildred Schenstad on Dec. 26, 1951, at Hanks, N.D. They had two daughters who died at

infancy and a son who died at age 2.

Henry Bakken got married at age 51 to Lois Ulvin on Sept. 30, 1952, in Williston, N.D. Lorin was their only son.

Harry and Mildred were Lorin's godparents and Lorin, at times, lived with them.

"Those four people were together all their lives," Lorin said of his parents and his aunt and uncle.

A country person.

Lorin graduated from Tioga High School in 1972 and worked on the farm until he moved with his aunt and uncle into town in 1992.

"I was happy and content to be on the farm," Lorin said. "Once you're a country person, you're always a country person."

Lorin, who never married, still owns the homestead and has never considered selling it. He said he didn't keep in touch with relatives who moved out of the area, so he's not aware of other surviving Bakken family descendants.

Lorin's land currently has one producing oil well on it. He is private about his personal gains from oil.

Even though he's a Bakken, Lorin has mixed feelings on the Bakken boom. He sees the economic benefits, but is nostalgic for the wide-open spaces that are changing as more wells are drilled and the population soars.

"On one hand, it's economic growth and it's good for the state and good for the people," he said. "On the other hand you miss it the way it used to be, too."
Caption: · Harry (left), Mary and Henry Bakken were photographed for a story that appeared in the Williams County Farmers Press on July 12, 1951. Photo courtesy of the State Historical Society of North. · This 1951 photo shows the H.O. Bakken oil well near Tioga, N.D., which gave the formation it's name. Photo courtesy of the State Historical Society of North Dakota. Amy Dalrymple, Forum Communications. · Lorin Bakken walks on his family's homestead near the site of the H.O. Bakken well near Tioga, N.D. Memo: "On one hand, it's economic growth and it's good for the state On the other hand you missit the way it used to be, too."

- Lorin Bakken.

Timeline: H.O. Bakken well.

· July 13, 1951: The Amerada Petroleum Company begins drilling on the H.O. Bakken farm near Tioga, N.D.

· Sept. 5, 1951: The drilling rig strikes oil.

· Sept. 23, 1951: Bakken family hosts striking oil celebration.

· April 16, 1952: Well is completed, production begins.

· 1952-1967: Well produces a total of 255, 526 barrels of oil from the Bakken formation.

· 1980: Well begins producing natural gas only. It produced 540, 157, 000 cubic feet of gas.

· Nov. 14, 1990: Well is plugged and abandoned.

Sources: North Dakota Industrial Commission and program from Bakken family celebration.

A drilling foe turns around - Ex-protester OKs shale gas extraction under her land

Chicago Tribune (IL) - Friday, November 23, 2012
Author: Andrew Maykuth, The Philadelphia Inquirer

Two years ago, Denise Dennis delivered a dramatic denunciation of natural gas development at a Philadelphia City Council hearing. She equated drilling to the tobacco industry and said that "Pennsylvanians are the lab rats" for a massive shale gas experiment.

The Philadelphia resident had a powerful story -- her family owned a historic, 153-acre farm in Susquehanna County, Pa., where her ancestors were among the first freed African-Americans to settle in Pennsylvania just after the Revolutionary War.

She became a potent symbol in the wars over shale gas drilling, which is booming in Pennsylvania and elsewhere but criticized by environmentalists.

"The process for extracting natural gas from shale is as dirty as coal mining," she testified to thunderous applause at the 2010 council meeting.

"Wow," said Councilman Curtis Jones Jr., who sponsored the hearing.

But Dennis' fervor has subsided in the past two years, undone by the financial need of preserving her family's deteriorating historic farm and by the salesmanship of Cabot Oil & Gas.

This month, Dennis signed a lease allowing the Houston company to extract the shale gas beneath her family's farm, which the National Trust for Historic Preservation has called a "rare and highly significant African-American cultural landscape."

"I decided to stop demonizing the industry and to start negotiating with individuals," Dennis said. "I had to be realistic."

The reality was that most of the surrounding landowners had leased their mineral rights and gas drilling was going to proceed with or without the Dennis farm.

"We were an island in a sea of leased land," she said. "As I saw it, the drilling companies were now my neighbors, and it was better to get along with them than to be antagonistic."

The lease preserves the Dennis farm by prohibiting Cabot from disturbing the farm's surface. The company can only extract gas by boring horizontally under the Dennis farm from wells drilled on neighboring land.

Dennis did not disclose the financial terms. But in 2010, she said that gas drillers had offered more than $800,000 for the right to drill. The landowner also receives royalty payments from any gas produced from the property.

The proceeds from the lease will benefit the Dennis Farm Charitable Land Trust, the organization that Dennis set up to preserve the farm that has been in her family for seven generations.

"I am trying to do what's best for the property," she said.

The first order of business will be to stabilize the farmhouse, a two-story, timber-framed Cape Cod dwelling built in 1859, which has been unoccupied for more than two decades and is collapsing.

The farm, now largely overgrown, was pioneered by Dennis' great-great-great-great-grandfather, Prince Perkins, a black Revolutionary War veteran who moved his family from Connecticut to northeastern Pennsylvania in 1793. The homestead and artifacts tell a story of free African-Americans who were integrated in a largely white community 70 years before emancipation.

Cabot spokesman George Stark said the company would have been able to develop its surrounding leases without signing up the Dennis farm. But by securing the Dennis lease, Cabot now has the rights under a larger contiguous area, and it can more efficiently exploit the mile-deep Marcellus Shale area.

"We were able to walk her though our process, the precautions we take," he said. "It was an opportunity to dispel some myths and rumors."

Dennis was well-versed on the downside of drilling. She had heard stories from embittered landowners in Dimock Township, Pa., five miles from her farm, where Cabot's gas drilling was blamed for polluted streams and groundwater. Cabot settled with landowners in August.

Her rousing, sarcastic testimony before City Council was widely cited by activists. But afterward, as Dennis began to moderate her position, she stopped attending rallies.

Iris Marie Bloom, the anti-drilling activist who recruited Dennis into the movement, said they are no longer in contact.

"I believe the financial pressures on her were absolutely enormous and the trade-offs painful," Bloom wrote in an email.

Dennis said she was still unconvinced that the hydraulic fracturing process used to extract shale gas is safe. But she toned down the anti-drilling rhetoric as she struggled with the decision.

"Yes, I was vehement," she said. "But where did that get me? And what would not signing have achieved?"

She is aware that some of her former allies will regard her decision as a betrayal.

"You don't get ideal situations in life," she said.
Caption: Photo(s)
Photo: Caretaker John Arnone, left, and Denise Dennis visit her family's 153-acre farm in Susquehanna County, Pa. Dennis recently agreed to allow the extraction of shale gas beneath the farm, a move she had been fighting two years earlier. Photo: "I decided to stop demonizing the industry and to start negotiating with individuals." -- Landowner Denise Dennis TOM GRALISH/PHILADELPHIA INQUIRER PHOTOS

CQ NEWSMAKER TRANSCRIPTS
Special Events
Nov. 29, 2012 - Final
Environmental Law Institute Holds Teleconference on Hydraulic Fracturing Science Update and Frontiers
LIST OF SPEAKERS

OPERATOR:
Welcome to the ALI CLE telephone seminar and audio webcast Hydraulic Fracturing Science Update and Frontiers. Featured faculty for today's program are Brun Hilbert with Exponent in Menlo Park, California; Timothy McCrum of Crowell and Moring LLP in Washington D.C.; Briana Mordick from the Natural Resources Defense Council in San Francisco, and John Schell with the Exponent in Houston.

If you have a question for the faculty, please send it by e-mail anytime during the conference to tsquestions@ali-cle.org. Please put faculty question in the subject line. Again, please send your faculty questions at any time to tsquestions@ali-cle.org. We will now begin our program.

HILBERT:
Good morning, or good afternoon. This is Brun Hilbert in Menlo Park, California. Welcome to our program today. And you'll be able to see now the faculty members. I'm Brun Hilbert, a principal engineer in Mechanical Engineering in Menlo Park; Tim McCrum, an attorney, he is a partner at Crowell and Moring in

Washington D.C., Briana Mordick, who's a staff scientist, geologist at the NRDC, and John Schell, a principal scientist in Toxicology and Mechanistic Biology at Exponent in Houston. I think we have a very good group of people here today to address what's currently going on in hydraulic fracturing from everything regarding litigation to public interest sector, to regulatory issues and risk assessment in toxicology; and when I get a chance, in hydraulic fracturing itself.

I'm going to give a few slides, like four, of broad overview and introductory remarks. Tim will then address current regulatory and litigation setting and other things that he's an expert in. Briana will talk about the current EPA work in previously promulgated regulations, and the current work on the report that is due next year by the EPA on hydraulic fracturing and seismic activity, what's going on about earthquakes as well. John Schell will talk about the current status and trends in the chemical risk and toxicological issues.

We'll have -- during that time, if questions come up between the panelists, we'll more or less interrupt each other and have a little panel discussion. And at the end, we'll have questions from you, the audience. I'd like to just say without retreading all the slides or anything like that, we want to keep up with the news. It seems to change every day. Even though hydraulic fracturing has been going on since 1947 and the boom occurred as we know it in the early 2000s, you can't pick up the newspaper or get an R.S. feed without getting something on hydraulic fracturing nearly every day.

We have a new administration. Well, it's actually the current -- old administration extended for four more years, and we expect some more ground regulations (ph) to come through the pipeline. There have been additional data releases from various places like Pavillion, Wyoming and in Dimock, Pennsylvania and other places around the United States where we've seen a lot of publicity in media regarding hydraulic fracturing; new state regulations. And I'll talk just for one slide about the current oil and gas prices.

Just to remind everyone, although you probably know it, here are the locations where shale oil and gas resources are in the lower 48 United States. Many of us are working in -- on issues regarding all of those locations. Back in 2004, this all kind of got started with EPA's report on coal bed methane, and at least coming to the conclusion at that point in time that there were no impacts to ground water. Of course, we all know that that has changed a little bit now and people are very interested in if there are impacts to ground water and air emissions.

Here is a little reminder slide of what a hydraulic fracturing well that we all think of when we think of these issues. And that's the long throw horizontal well in a shale formation. Although this is also applicable in many cases around the United States to oil in tight gas sands. And I won't spend any more time on that.

And then one thing that I'd like to talk about is the current price of natural gas. And here, I show on the red curve the price of natural gas since 1993 and the number of wells, unconventional wells spudded in, for example, Pennsylvania since 1993. And we see that in about 2004, 2005, there was a sudden and dramatic increase in the number of wells drilled in Pennsylvania. Now we're up to about 6000 unconventional wells that have been drilled since that period in time.

And we see a little bit of the indication that with the lower price of natural gas below $4, we see the slope of that curve of spudded wells just tailing off a bit. So, there is a driving factor here with regard to the price of natural gas. And what are we going to do with all the oversupply of natural gas? Put it in cars, put it in buses, put it in trucks; more development in liquefied natural gas. These are current thoughts that we have on future trends as I see them.

I'm going to hand off the ball here to Tim McCrum to talk about his presentation. Tim?

MCCRUM:
Thanks, Brun. Good afternoon. I'm with Crowell and Moring law firm in Washington D.C., and I'm going to begin from a bit of a broad perspective and picking up with Brun's observation about how much this hydraulic fracturing topic is in the news. We have -- we have a Wall Street Journal article from just about 10 days ago, a front page article that is focusing on the major economic opportunities from this revolution in shale gas and shale oil development in the United States.

And I think it's important to keep that in mind as we talk about these regulatory issues and public concerns that have emerged that there are huge economic benefits from this activity. In the recent presidential debates, they were recognized by both candidates. And in the -- in this public debate, not always widely known is that the United States is already the number one natural gas producer in the world.

And their recent reports that were publicized just a couple of weeks ago are indicating that the United States is soon projected to be the number one oil producer in the world. And so, these are very, very significant positive trends that have emerged from the development of the shale formations and the combination of horizontal drilling and the hydraulic fracturing practice that's been in place for many years.

I'm going to present a general viewpoint that these environmental risks that are associate with these activities are modest and manageable, and already subject to federal and state regulation, and that some of the risks have in fact been exaggerated quite a bit in public dissemination of information. The -- Brun talked about the decrease in the natural gas price. And what that is doing is producing a lot of beneficial effects in terms of lower prices to consumers and lower prices to U.S. manufacturing, and really providing a basis for a -- a -- a rebirth in manufacturing in areas where it had not been in the past. We have the first new steel plant going up in Youngstown, Ohio in decades as a direct result of these new production activities with shale gas.

This is a slide that is quite familiar to many of you showing the vast shale gas and shale oil areas that have -- that I identified in the last several years and in the -- in the past -- over the past decade, but particularly in the past several years. And I'm going to focus a fair amount of my discussion with the Pennsylvania Marcellus shale example, which is an area that I've been doing quite a bit of work in in the past four years.

And you can see that the Marcellus and Utica shale formations in the eastern U.S. are, you know, quite extensive and -- and -- and have resulted in that 6000 well number that Brun referred to in Pennsylvania in the past -- in the past five years or so of shale gas wells that have -- that have reached the Marcellus through drilling. And many of those wells are in production now.

It is not widely known at -- often that Pennsylvania is not only the site of the -- this new Marcellus activity, but this is actually the birth place of the world oil industry in Pennsylvania where the first Drake oil well was drilled in 1859, and early natural gas wells in Western Pennsylvania back to 1878. And the first natural gas production in the United States was in Western New York, all the way back to 1825 from very shallow wells near Fredonia, New York.

These -- the fact -- these wells that were so shallow is also is also indications that you have natural gas present in these areas at shallow depth naturally. And just something to keep in mind from the standpoint of background levels of natural gas and oil in the -- in these historic areas. The Marcellus shale formation is quite large, covering portions of -- major portions of Pennsylvania, West Virginia and New York, Ohio and Maryland. And the Utica shale below the Marcellus underlies a substantial amount of that -- of that region as well.

An interesting fact about Pennsylvania is that the Pennsylvania DEP estimates that there have been 350,000 oil and gas wells drilled in Pennsylvania since the Drake oil well. So from that standpoint, the 6000 new Marcellus wells is are -- quite a small fraction of the historic wells that have been drilled in the state.

As Brun indicated, the hydraulic fracturing process is not new in the United States and has been used in the United States and in -- and in Pennsylvania for over 50 years, really on a continuous basis. In Western Pennsylvania, there has been continued oil and gas production at relatively modest levels from conventional formations continuously since the 1800s. And therefore, the hydraulic fracturing technology came into play there over the past half century.

Another practice that has been used in Pennsylvania and elsewhere around the country is water flooding of a secondary recovery method, also used in the United States for over 50 years involving injections of

ground water and surface water. And the volumes involved there are actually larger than the hydraulic fracturing water volumes even with the horizontal drilling technique. So, that's -- some of that historical background, I think, helps put in perspective the issues that have been -- that are raised in connection with the new shale drilling activities. But this is not -- these are not entirely new risks at all that are -- that are being presented.

Here's another depiction of a typical horizontal drilling schematic showing the -- comparing a horizontal drilled well versus a vertical well to the left in the schematic. And this is in the context of the Marcellus shale which is typically 6000-8000 feet below the surface. And the horizontal wells can proceed for several thousand feet. And the shale that is -- where the hydraulic fracturing occurs is, you know, at great depth as compared to the ground water used for drinking purposes at the surface in the upper 500 feet, and more typically in the upper 200 feet.

This next schematic shows how the -- you can have multiple horizontal wells drilled from a single well pad site. And this depicts how one significant environmental advantage of the -- of the horizontal drilling technique is to -- is shown here in the sense that you are covering an area laterally that would -- that would otherwise require, in this case, in this hypothetical case, 24 vertical wells requiring 100 acres of disturbance as compared to a handful of acres that would be affected by one single Marcellus or shale -- horizontally drilled well that would be able to just have that limited surface impact and reach a very vast area from the subsurface.

And particularly, in the context of public lands, or really in the context of any lands, this is -- this is a, you know, significant advantage of the horizontal drilling technique. And that is also reflected in my next slide here, that -- also pointing out that the water flooding technique which has been in place for 50 years and has generally not been the matter of significant public concern as a secondary recovery or enhanced recovery method, uses greater water injected into the formation than the shale horizontal drilling techniques and hydraulic fracturing associated with that.

In my view, there has been really an unwarranted amount of public fear that has been generated concerning the hydraulic fracturing activity. And this has come about in many cases from media reports and statements by certain environment NGOs. I give an example of one recent NGO statement which takes issue with -- well, portrays a quotation from Exxon Mobil CEO Rex Tillerson who makes a statement in a congressional hearing in 2011 that there have been over 1 million wells hydraulically fractured in the history of the industry, and there has been not one reported case of a freshwater aquifer having been contaminated from hydraulic fracturing.

This particular statement is actually not challenged, but it is nonetheless portrayed as a -- as a false narrative because it is so -- allegedly so limited about the -- what is a hydraulic fracturing process. But in fact, I would suggest that this hydraulic fracturing process is in fact the process of the subsurface fracturing of the -- of the sedimentary formation, and that is -- that is what has been put in (ph) issue in the public mind about whether hydraulic fracturing is some kind of phenomenon that is -- that is new and -- and -- and something to be feared.

And that has resulted in de facto moratoria in some of the areas in the -- in the east in particular where the Marcellus and Utica formations extend in New York and Maryland. And basically, those, you know, state policies are depriving citizens of jobs and economic opportunities associated with their property rights in their -- in their communities, and effectively also denying companies that have, in some cases, made investments in those areas and are waiting for some resolution of the issues that have been raised in those particular states. Whereas in Pennsylvania, Ohio, and West Virginia for example, the drilling activities are proceeding, and the economic benefits are being enjoyed by people in those -- in those states and resulting in the lowering of natural gas prices that has been described already.

Now, I posed one fundamental question for consideration and focus in my discussion. And this is certainly not the only question that relates to this topic, but I think a fundamental question is whether hydraulic fracturing can in fact be carried out without contaminating ground water aquifers? And just what is the -- the -- the evidence that bears on this question that's available to us at this point?

And I think when we -- when we look at the evidence and the views of state regulators in particular that have extensive experience with this topic, the evidence is quite overwhelming that there is not a serious risk of ground water contamination from the hydraulic fracturing process itself in connection with shale gas and shale oil development. And where there has been any kind of concern associated with a particular well, it has tended to be associated with well completion technologies at the -- at the surface, which are really issues that are -- that are involved with any oil and gas well and are not particularly associated with the hydraulic fracturing process

This next schematic shows an idealized well casing that reflects the multiple levels of casing that are used to protect the surface water -- ground water for -- ground -- I'm sorry, the ground water aquifers near the surface to isolate the oil and gas in the well from those surface formations. And this is -- this is a subject that's -- the subject of state regulation and industry best practices. And the industry has every incentive to keep these wells as sound as possible, and is -- any -- any -- any potential leak from that -- from that upper casing area is really not connected with the hydraulic fracturing several thousand feet down below.

A particular study that I would suggest is relevant and informative on this is a study that was funded and sponsored by the U.S. Department of Energy and the Groundwater Protection Council back in 2009, in May of 2009, and it addressed this question of ground water, whether groundwater formations are in fact at risk from the hydraulic fracturing process. And they generally found that these risks were reduced by the natural geologic features themselves in the -- in these formations and by state regulation. And in particular, this particular report found that state agencies with knowledge of the local conditions and geology are actively regulating the oil and gas activities, and that the hydraulic fracturing impacts are well understood by these state regulators.

Now, I -- next, I want to quickly go through some information that's out here in the public domain. These particular quotes from a variety of state regulators are on the Energy in Depth website. And these are quotations of statements from oil and gas regulators from around the country, states such as Alaska, Colorado, Indiana, Louisiana, Michigan, there -- where state regulators are -- have been confirming over the past few years that this issue has risen in public -- the public eye that in these states, there has not been an identified case of ground water having been adversely affected from the result of hydraulic fracturing.

And I will just quickly go through a number of these examples. Michigan, it is interesting that it has the Antrim shale formation which is at more shallow depth as compared to the Marcellus. And there are almost 10,000 Antrim shale wells in Michigan producing natural gas at depths from 500 to 2000 feet. And yet, the state regulator there has also found that there's no indication that hydraulic fracturing has ever caused damaged to groundwater there.

Other statements have been made by oil and gas regulators in Oklahoma, Texas, South Dakota and -- let me take a look at some of the others -- example we have here. Pennsylvania has been the subject of the fair amount of attention in the -- in the media there as the 6000 Marcellus wells have been put in place over the past several years. And there, we have a Pennsylvania DEP former regulator Scott Perry, director of the Bureau of Oil and Gas Management stating that he is yet to -- yet to have seen an impact of fracking actually communicating with fresh groundwater resources. Wyoming, the regulator there has provided similar statements.

And we also have statements regarding -- from the Pennsylvania DEP, from the former -- former -- former DEP secretary in the -- in the past administration of Pennsylvania as well as the current administration. So, I go through those examples. Other states that have made statements such as this include Alabama, Colorado, and Oklahoma. And we have other final examples here from the DEP former Secretary John Hanger who stated that they have not seen a single case of fracking fluids coming back to groundwater in the states. So, these are statements that have been made -- have been made in the last couple of years by the Pennsylvania DEP.

I also have some examples of statements that have been made by EPA Administrator Lisa Jackson as recently as April 2012 and May 2011 stating that in no case have we made a definitive determination that hydraulic fracturing has caused chemicals to enter groundwater. And Administrator Jackson also stated

she was not aware of any proven case where hydraulic fracturing itself has affected water. And I know -- I don't have it in the presentation, but similar statements have been made in congressional testimony by the director of the BLM in this -- in this current administration in the last year or so.

So turning back to the Groundwater Protection Council-U.S. Department of Energy study, the conclusions set forth in that study are, I think, pertinent and worth significant consideration. That -- and that is that the regulation of oil and gas field activities is managed best at the state level where regional and local conditions are understood. There's obviously a significant difference in regional conditions in the Appalachian region in the east as -- compared to the arid Western states. And the states are really in the best position to take account of those -- of those differences in -- in -- in regulatory programs.

Other conclusions from this 2009 U.S. DOE sponsored study are that state oil and gas regulations are adequately designed to directly protect groundwater resources through the application of permitting well construction, well plugging, and abandonment requirements, and also that industry best management practices are also important to provide environment protection.

There are federal enforcement authorities that have some potential application here. You know, RCRA Imminent and Substantial Endangerment authorities are -- exist. I don't think that they're particularly warranted to be applied in any situations, but they do exist. And also, the CERCLA program applies to hazardous substance releases that -- that -- that may occur.

And then also, we have the Safe Drinking Water Act underground Injection Control Program that is in -- is in -- is in place. It has -- it has limited direct application to the oil and gas activities at this time, but the, you know, the statue exists and that is something that EPA is going to be looking at about how it may -- how it may be -- what potential changes if any may be -- may be warranted. And of course, the Clean Water Act permitting of point source discharges and filling of waters of the United States has applicability to these activities today.

BLM has been -- proposed a rulemaking in the past year to consider increased public disclosure of chemicals used in the hydraulic fracturing that would apply to federal public lands and Indian lands, and also take a look at existing federal regulations applying to well bore integrity and evaluate whether potential changes may be -- may be warranted there. And then finally, of course, EPA has been carrying out a hydraulic fracturing and drinking water resources study, and there is a draft expected by late this year that will be looking at a full range of issues relating to hydraulic fracturing and whether environmental risks to drinking water are being adequately protected at this time.

Finally, I'm going to briefly mention some litigation that has occurred in the federal courts in Pennsylvania in the Marcellus shale area, and this is a case that we have been involved in representing the Pennsylvania Independent Oil and Gas Association. The case is called Minard Run Oil Company and PIOGA, the U.S. Forest Service and the Sierra Club. And I think the case is informative here to this discussion because it involved a 2009 settlement agreement between the Sierra Club and the U.S. Forest Service that would have closed a 500,000 acre portion of the Allegheny National Forest, covering four counties in Western Pennsylvania to all new oil and gas drilling pending a forest-wide EIS that would have taken several years.

And therefore, that settlement agreement created a de facto drilling ban. And in this case, the Pennsylvania oil and gas industry was able to seek and obtain a preliminary injunction in joining that drilling ban based on a wide variety of factors. And the federal district court in Pennsylvania and then a firm by the third circuit granted the preliminary injunction and ordered the Forest Service to process well proposals under the common law in Pennsylvania without lengthy and costly NEPA studies and recognized that Pennsylvania DEP regulation of oil and gas fully applied to these activities, but found that there was irreparable harm to the oil and gas businesses and communities from this de facto drilling ban covering 5000 acres.

And as a result of that preliminary injunction, numerous oil and gas wells were able to proceed in 2010 through 2012, including Marcellus wells. In that case, federal district court Judge Sean McLaughlin found that there was substantial evidence that the drilling ban was -- would have had a severe adverse

economic effect on the oil and gas businesses active in that area, and in the community, small and large businesses as well, and that a preliminary injunction was appropriate to protect the property interest that were at stake in the oil and gas property rights that were in that -- in that national forest area.

Another aspect of that case of note is that while that litigation was pending, the Forest Service adopted a ban on groundwater use for hydraulic fracturing and shale formation. So even after the drilling ban had enjoined in June of 2011, they -- the Forest Service issued a new ban on groundwater use in hydraulic fracturing and shale formations. That ban was challenged through a contempt of court motion.

While the litigation was pending, the Forest Service then rescinded the groundwater use ban, and the contempt of court motion was denied. But the groundwater use ban remained rescinded to the present date. So, these are some lessons from this case that I think have some broader applicability, and that is that the court considered a wide variety of public interest factors and determined that the -- that the -- a drilling ban was not supported by the -- by the facts that were present in this case.

And these are the -- some final conclusions of that case that -- there was no federal action subject to NEPA there and that the Forest Service had limited authority over the private (inaudible) states (ph) and that state oil and gas regulation was recognized as protective.

So in conclusion, you know, there are inevitably some environmental impacts from natural resource development including oil and gas production. It -- it -- it will have some impacts; clearing of some land for well pads and pipelines, some level of truck traffic, and noise and dust. But these types of impacts can be mitigated, and the -- also, the land owners involved are benefiting from the economic impacts which are, you know, adding to their standard of living. And, you know, those are certainly relevant considerations in this overall public policy issue.

In addition, the industry is -- clearly has many incentives to minimize environmental impacts, minimize common law liabilities. And the industry is taking significant efforts to -- to -- to -- to act in an environmentally responsible manner, and has strong incentives to do so including from an investment standpoint, from a -- from a -- and, you know, most of these companies that are engaging in this are public companies that have every reason to want to maintain good public reputations with the public as well as -- as well as the regulatory agencies.

MCCRUM:
So in conclusion, in my view, improved implementation of existing regulations with potential modest changes is the way to address the modest environmental risks associated here. And the states are best equipped to regulate these environmental impacts of shale oil and gas extraction.

Additional study from neutral scientific organizations may provide useful information on the scope of the risks and how to manage those risks. But the exaggerated fears that are not based on science hurt the economy and deprive citizens of the -- of jobs and use of their land. And the modest risks involved here do not -- do not warrant draconian policies.

And finally, I'll share one other bit of Pennsylvania history with you all. And that is that it is not widely known that the oil and gas industry in Pennsylvania helped save the whales. And this is a political cartoon from about 1861, actual political cartoon depicting whales celebrating the discovery of oil in Pennsylvania because at that time, whale oil provided the dominant source for lighting in the United States and the world. And certainly, this is not a very well known example of some environmental benefits from oil and gas activity.

And with that, I'll conclude. Next, we are going to have Briana Mordick of NRDC. And I think she is likely to have some views different from mine, I suspect.

MORDICK:
Thanks.

(LAUGHTER)

So, a couple of you will mention this. For those who aren't familiar, EPA is conducting a multi-year study to understand the potential impacts of hydraulic fracturing on water -- groundwater. They finalized the study plan late last year, and they'll be issuing their first progress report next month.

Now, this progress report isn't going to include any conclusions or interpretations. It's really just going to be a progress report on what they've done so far and what the future work will be. They will be releasing some of the raw data from their retrospective case studies, some of the raw water sampling data. But there will be no accompanying analysis or interpretation.

They're actually discouraging other people from other people trying to interpret it because it is, sort of, out of context of the broader study. But they have gotten quite a bit of public interest having that data released. So, they're planning to do that.

So, this study really is the first of its kind to take a comprehensive look at the relationship between the hydraulic fracturing water lifecycle and drinking water risks, drinking water and groundwater. They're performing literature reviews, they're doing lab work and lab experiments, and they're also doing field work.

So, of course, there has been a lot of stakeholder interests in this study, and they've also done probably more stakeholder outreach on this study than in any study throughout their history. One part of that process, two weeks ago, they held a series of five technical roundtables, and those are focused on the five pieces of the hydraulic fracturing water lifecycle as defined by EPA. So, you can see those there. It's the water acquisition, chemical mixing, well injection, blowback and produced water, and wastewater treatment and waste disposal.

For each session, there were stakeholders present, technical experts from stakeholder groups which included NGOs, the industry, and oil and gas regulators as well as some people from academia. The EPA presented their research plans and the activities to date, and then they basically just opened it up for a discussion of their methods, their assumptions, their data. The goal of these workshops was to identify some key research topics to be the subject of more detailed technical workshops in the future.

So, EPA is going to take all this information that we discussed at these workshops. They're going to determine how many workshops they should have and which topics they should cover. They are then going to invite technical experts to present at these technical workshops. So, this will really be a chance for EPA to, sort of, gather additional data.

The study began in 2010. A lot of the data that they're using is from 2010. And of course, this is an industry that evolves extremely rapidly. So, they're really seeking additional data, additional information to improve the study.

So after these technical workshops, there is going to -- going to reconvene these technical roundtables with the same people as follow- up. And as I said, the overall goal of this is really to improve the study, to make sure that EPA has the most recent data and information, all the information on currently used practices in oil and gas industry. They really want this study to be comprehensive and to be complete and based on the best available data.

HILBERT:
Briana, this is Brun Hilbert.

MORDICK:
Sure.

HILBERT:
I don't want to -- don't mean to interrupt you, but I wanted to ask you where well integrity in those five roundtables is located. Is that under number three, well injection? (Inaudible).

MORDICK:
It is. Yes.

HILBERT:
Okay.

MORDICK:
So, under -- yes, under well injection, they'll be looking at basically the, you know, the actual hydraulic fracturing, the active hydraulic fracturing. So, yes, injecting fluids into the well.

HILBERT:
Cementing, casing, and all that stuff?

MORDICK:
Yes. And, you know, I think they're probably going to look at that in those -- particularly well construction issues in a more limited way, because of course, they are sort of focusing on water itself. But yes, I mean, obviously that's a very important piece of water protection, is how you construct the well. So yes, it will fall under that well injection category.

HILBERT:
Thank you.

MORDICK:
So, part of that, it will be to actually have a lot of well files. And they're reviewing thousands of well files from different operators, and they'll be looking at, sort of, typical construction practices as part of that review.

And so, the final report is going to be available on 2014. So, it's still a ways off. Obviously, this is going to be closely watched by everyone on all sides. And, you know, hopefully -- the study that they've outlined is a very good study.

The scope is appropriate. You know, they have designed appropriate methods for the questions that they're trying to ask. So, you know, I think there's high hopes that this will be an excellent report out of EPA.

So, I want to shift gears a little bit and, sort of, talk about environmental risk from NRDC's perspective. Of course, this is an industrial process. There are risks throughout the entire lifecycle of the process; risk to air, water, land, community. There's risk from multiple sources; from the wells, from geology, from the waste water; but sort of sticking with the, sort of, theme of water and EPA study, I kind of want to focus on the risks to water, looking at sort of, two of the highest risk pathways from NRDC's perspective.

As I said before, the technology that's used to extract oil and gas from the ground evolved extremely rapidly. And in most cases, regulation lags this technological -- advancement and doesn't lead. Interior Secretary Ken Salazar recognized that. He stated in a testimony to Congress that BLM's current regulations specific to hydraulic fracturing, or stimulation operations are in many ways outdated. They

were written in 1982, and they reflect neither the significant technological advances in hydraulic fracturing nor the tremendous growth in its use that has occurred in the last 30 years.

So in terms of risk to water, one of the biggest risks is the well itself. So, the well is the one piece that actually physically touches both drinking water and the hydrocarbons and any fluids that are injected into that well. A lot of the high profile contamination cases that have been in the media that people are probably aware of are actually failures of well construction.

So in a thing like Dimock, in Garfield County, Colorado, in Bainbridge, Ohio, a lot of these -- in issues of methane intrusion in particular are failures of well construction. And so, there are a lot of pieces to well construction that need to be regulated and enforced properly in order to ensure the wells are constructed properly.

It really starts with proper drilling techniques. This includes things like picking the right drilling fluids, collecting data as you're drilling, and properly cleaning and conditioning the well bore to ensure that the cement and the casing bond completely to the rock to get -- to get that -- isolation. Isolation is really the name of the game. You know, the well itself has to keep those hydrocarbons isolated from drinking water and any other minerals, or brines, or anything that are in the subsurface.

And so, properly cementing that well is extremely important. Making sure that the cement comes high enough is an issue, again, with some of these high profile cases. There's actually been shallow gas that has migrated into drinking water rather than gas that's coming from the actual production zone. So, there's a lot of risks with well construction, and it's, you know, one of the more recognized pathways by which contaminants might migrate into drinking water.

Another important piece of well construction is testing. So, ensuring that your cement is properly set, ensuring that your casing can withstand the pressures that it's going to be subjected to during hydraulic fracturing, evaluating that cement job to making sure -- to make sure you're getting that proper isolation.

MCCRUM:
Briana, this is Tim McCrum. I wonder if I might interject. I'm pleased that you and I seem to have an area of at least some common agreement here that the -- that the main issue in terms of a threat to groundwater resources is in the well completion technology ...

MORDICK:
Yes.

MCCRUM:
... near the surface and -- and -- and -- and not so much at the hydraulic fracturing process down in the formation several thousand feet below. And that's encouraging.

MORDICK:
Yes.

MCCRUM:
And I -- I -- I -- just wondered if you might respond to the idea that that kind of a well integrity issue is something that's present is -- that's an issue with all oil and gas wells in -- you know, vertical wells, in any well where hydraulic fracturing would be -- any well where fluids are ejected, which has been true for decades in the past.

MORDICK:

Yes. I mean, I would agree that well integrity is an issue ...

MCCRUM:
Yes.

MORDICK:
... regardless of the type of well you're drilling.

MCCRUM:
Yes.

MORDICK:
And, you know, it's part of the reason that the EPA's underground injection control program doesn't regulate simply the active injection. They regulate the entire process from where you put the well, to how you construct that well, to how you inject your fluids, to how you close that well.

MCCRUM:
Yes.

MORDICK:
So, yes. I mean, I think, you know, well construction is a hugely important issues.

MCCRUM:
Yes.

MORDICK:
And a related issues is abandonment of old wells. You know, as you stated, you know, there have been 350,000 wells drilled in Pennsylvania. Obviously, the technology for how you drill and construct those wells has evolved incredibly over, you know, the 150 years ...

MCCRUM:
Yes.

MORDICK:
... in which oil and gas drilling has happened. And so, these orphan wells are a significant problem. Some states actually have what they call orphan well programs basically to identify these wells that have been improperly abandoned, which could provide migration pathways for contaminants to reach groundwater.

So yes, I -- yes, I would agree from start to finish, well construction is a hugely important area.

MCCRUM:
Yes.

MORDICK:
The -- one of the other high risk pathways is the way waste water is handled. So, when you drill an oil and

gas well, there's water naturally present in the subsurface. It's a brine water. The composition can vary quite a bit.

It's referred to as produced water. So, it's just co-produced as a natural byproduct of oil and gas production. And there is a lot of it. In the United States, there are hundreds of billions of gallons of produced water generated every year. And that -- as I said, that water can have a range of compositions.

It can be nearly fresh all the way to many times saltier than seawater. It can contain hydrocarbons, other naturally occurring contaminants that are present naturally in the subsurface like radioactive material, it's usually .low level radioactive material, heavy metals, BTEX compounds, volatile organic compounds. So, this waste water can have many potentially hazardous components to it.

The other piece of wastewater is what's referred to as flow back. Some people use produced water to include both of those things. Flow back, more narrowly speaking would be the unused hydraulic fracturing fluid that returns to the surface after hydraulic fracturing. And of course, that also needs to be handled as well as hydraulic fracturing becomes, you know, more prevalen. And as it's used in higher volumes, of course there are -- there are higher volumes of this wastewater to deal with; although some of it does stay underground. And we can bit a little bit more into that later.

So surface spills and releases of hydrocarbons and produced water are some of the most commonly cited environmental impacts of oil and gas production. There's actually quite a bit of data and studies that have been done on this topic. One of the issues is that remediating spills of produced water can be very technologically and financially difficult, if not impossible.

The USGS did a study of an oil and gas production site in Oklahoma, and they found that even after 60 years of natural attenuation, there was still impacts to groundwater and soils from spills of produced water. So, it can be very difficult to clean these things up. So, preventing these spills in the first place is incredibly important to protecting groundwater.

So there are a couple of stages to how wastewater is handled. The first is temporary storage. So when that flow back comes back up after hydraulic fracturing, it's often stored in open pits. You know, this presents a greater environmental risk because those pits can spill. They can leak.

The preferred method would be to store those fluids in closed tanks. That also aids in transportation. You know, you don't have to do it, sort of, two-step transfer. It also aids in being able to reuse and recycle that fluid.

And the other issue is, you know, just the transport and handling of this fluid. It's often transported by trucks, which has additional impacts. Nationwide, about 90 percent of the produced water that comes from oil and gas wells is put back down into a disposal well. So, it's reinjected into the subsurface.

Pennsylvania is a bit of a unique circumstance because they have very few oil and gas -- I'm sorry, very few disposal wells. So, they actually have a higher percentage that's either shipped out of state to a different disposal well. People are probably aware of the issues that they had with this wastewater being sent to publicly owned treatment works, which were unable to completely treat and properly treat that water to then release and was causing impacts to local streams. That's been phased -- mostly phased out. They're working on completely phasing out the -- sending that wastewater to publicly owned treatment plants.

But the -- as I said, the volumes of it are quite large. And so, there is a potential synergy that people are seeing here between, you know, there's a great need for fresh water for hydraulic fracturing. You know, on average, for a high volume hydraulic fracturing job, somewhere around 5 million gallons of fresh water, but there's also a great volume of this waste water that's generated.

So, a sort of emerging field, a hot topic right now is how do you reduce fresh water use? And how do you use more of that waste water to replace fresh water? So, there are, sort of, a lot of different ways that's being investigated.

One thing is that that flow back can produce water depending on a composition. It can actually just be reused directly. They -- as I said, you know, when you inject that water for hydraulic fracturing, only a portion of it comes back to the surface; you know, on average, maybe 50 percent, but it can be much smaller. It can be, you know, only 10 percent, all the way up to maybe 90 percent of it comes back.

And so, operators are starting to more often reuse that flow back for future hydraulic fracturing jobs. And if it's a relatively small volume as compared to the whole volume of the hydraulic fracturing treatment, they're actually able to reuse it directly and just dilute it with fresh water.

To really use larger volumes of it, it does require treatment. Part of the issue is that, you know, as I said, these waste waters can contain a lot of different things. It can be very salty. They contain a lot of chemical components which can lead to unwanted chemical reactions when you add the hydraulic fracturing chemicals in. So, there's been a lot of increased focus and a lot of interest on effective and cost effective ways to treat this water in order to be able to reuse it. So, a lot of different methods that people are looking at.

And of course, one of the other issues is that a lot of these methods create a residual waste, which is a very concentrated form of these wastes. And those need to be disposed of properly as well. But, you know, finding more and better ways to recycle this wastewater and reuse the wastewater can help cut down on the freshwater use.

Some of the produced water is actually essentially clean enough to just be reused directly. It can be used for agricultural or industrial uses. And this water can also be used for enhanced recovery, as Tim spoke about.

There's also some work on alternative fluids to using freshwater. One -- and these aren't new. They've actually been used for a while, are energized fracks and gas fracks. So, an energized frac is where you use carbon dioxide or nitrogen mixed with some water and essentially make a foam. Gas frac would just be straight gas, no water mixed with it.

Now some of the issues with these is they've been used more out of necessity than as an alternative to freshwater. Some of these shale formations are incredibly sensitive to contact with water, and they swell if they touch water. So, these have been used in those circumstances.

They haven't been as effective as the hydraulic fracturing job. In particular, a gas frac can't carry a proppant. So, you can't prop those fractures open when you do a straight gas frack. So, there would need to be some technological advances in those in order to see wider use.

People have also started to looking at using liquid propane. This has been used on a limited basis. Essentially, it's injected as a gel, and then it flows back to the surface as a gas and just goes straight into the same pipeline through which you'd sell your gas. And that again has also had limited applications. And then people are even starting to look into using alternative wastewaters, things like acid mine drainage, particularly in Pennsylvania and other industrial wastewaters to replace freshwater.

For me, I think probably some of the biggest advancements are going to be in just an improved frac design and efficiency, and innovative drilling and fracturing techniques. If you're -- I don't know if you are all familiar with Mark Zoback from Stanford, but I once heard him say that, you know, people who really understand how hydraulic fracturing works understand that it shouldn't work.

So, the approach right now is kind of just brute force. You know, there's sort of a similar design used throughout the entire well. There's a lot of room for really tailoring the way that hydraulic fracturing is performed to hopefully reduce water use and make hydraulic fracturing more efficient.

There's researchers at some of the national labs are also looking at some sort of innovative fracturing technologies. I heard Julio Friedmann give a presentation on, sort of, controlled underground explosions. So, for people who are worried about hydraulic fracturing, wait until you hear about controlled

underground explosion. So, there's a lot of science and a lot of progress to be made in, sort of, improving the efficiency of fracking and also reducing freshwater use.

So finally, I just want to touch on this issue of induced seismicity. It's been in the media a lot of course. It's drawn a lot of attention. So, this graph is using data from a study that was published earlier this year by the National Resource Council of the -- I'm sorry, National Research Council of the National Academies of Science. They released a paper on induced seismicity related to energy technologies.

As you can see, they looked at 10 different technologies, and they looked through the published literature to find incidences of induced seismicity that have been caused by these different extraction technologies. They found the maximum magnitude of an earthquake that have been documented, and also recorded a number of other factors like the number of projects, et cetera.

So, you can see that hydraulic fracturing for shale gas production number five, the maximum magnitude of an earthquake that had been caused by hydraulic fracturing when they published this study was a magnitude 2.8. So, there are currently three documented incidences of hydraulic fracturing causing earthquakes. That number to the right of that, 3.8, is a study that came out of British Columbia after the National Academy has published their research. The hydraulic fracturing there induced a magnitude 3.8 earthquake.

So today, there are -- there are a few documented incidences of hydraulic fracturing causing earthquakes. But there's a very well- established history of injecting fluids or removing fluids from the -- subsurface causing induced seismicity, and you can obviously see that. You know, some of the other high profile incidents lately have not been from hydraulic fracturing. They've been from the wastewater disposal; the wells that are being used to inject that wastewater back underground.

So, sort of the upshot to this is that, you know, it's a fairly well studied and documented phenomenon. You know, we have pretty good understanding of the mechanism, and there's a very strong correlation between the volume of fluid that you inject and the maximum magnitude of an earthquake that you can cause. So, since hydraulic fracturing injects relatively smaller volumes relative to some of these other technologies like wastewater disposal or water flooding, things like that, statistically speaking, it should cause smaller earthquakes than these other technologies.

The other sort of upshot is that other industries, particularly the geothermal industry, have developed, sort of, cookbooks for how you can manage this risk. Basically, you know, you start with site characterizations, and trying to identify any faults that might be in the area and avoid injecting directly into those.

And, you know, then there's monitoring that occurs. You know, if you start to notice more seismic activity, you know, they -- a lot of these approaches are sort of a stoplight approach. So, you know, you sort of take precautions along the way as you see -- as you see increased seismic activity.

MCCRUM:
Briana, this is Tim again. I wonder -- there was one finding in the National Research Council report that I found striking, and that was the finding that hydraulic fracturing in a well for shale gas development has been confirmed as the cause for a small seismic event at one location in the world, and I think that's out of an estimated -- well, it's -- there's 35,000 such wells in the United States, I believe. And that seemed to be indication that it's a very small risk that the hydraulic fracturing itself is associated with substantial seismic events. Is that -- is that your understanding?

MORDICK:
Well, yes. I mean, so like I said, so far there have been three documented incidences. So, the -- there was one in the United Kingdom, there was one in Oklahoma, and there's been -- this most recent one in British Columbia and Canada. And so, I'd say in the spectrum of risk, yes, it's sort of a lower risk issue particularly because generally, the earthquakes that are induced by hydraulic fracturing are below that, which can be felt by humans.

MCCRUM:
Yes

MORDICK:
And typically, they won't cause damage or injury. But I'd say the other piece is that, you know, these are the only documented incidences.

MCCRUM:
Yes

MORDIC:
So, it doesn't mean that others haven't occurred.

MCCRUM:
Yes

MORDICK:
It just means that they haven't been recognized as such.

MCCRUM:
Yes

MORDICK:
I think one of the important things is, you know, for these three incidents where they have pretty conclusively tied it to hydraulic fracturing is to get that data publicly available as much as possible to researchers so they can start to understand this phenomenon better.

And as I said, you know, the mitigation strategies for this are relatively easy to implement. Currently, it's unregulated by the state and federal government. And so, it's something that would be relatively easy to mitigate. But yes, in the spectrum of risk, it is a lower risk issue.

HILBERT:
Okay. I'm the moderator, so I'm going to push this on to John Schell since we have to wrap up by 11.

MORDICK:
Yes.

HILBERT:
But thank you, Briana. I'm very interested in both the well integrity and the earthquake issues since I live out here in California and we get questions like this all the time.

MORDICK:
Yes.

HILBERT:
And so do you, by the way. John, would you like to proceed?

SCHELL:
Sure. Thanks, Brun. For the next few minutes, I would like to give everyone a perspective from a toxicologist's point of view. I (inaudible) the wrong slide. Which one do you see, Brun?

HILBERT:
I'm seeing today's topics.

SCHELL:
Okay. There we go. One of the things that I -- one of my first entries into this business was looking at the composition of frac fluids. And when we originally -- this was about four or five years ago, and when we originally got involved in it, we got a pretty basic understanding of the -- what goes down a well in a typical fracking operation.

And as everyone knows, they've seen this slide several times, it's primarily water. About 90 percent of it is water, and another -- almost 10 percent of it is proppant. And so, there's a very small component of the frac -- of the material that goes down the well that is actually composed of these chemical components known as frac fluids.

MCCRUM:
John, the proppant is what material typically?

SCHELL:
It's primarily made out of sand, Tim. And it's used -- when it goes down the well, when the fractures occur, the sand is a physical component that keeps the fractures open.

MCCRUM:
Yes.

SCHELL:
And so, it's a -- it's a major component of the material that also goes down the well. And in the last couple of years, more and more information is becoming known about the actual composition, the chemical components that comprise these frac fluids. And what we've been able to see is that as the information becomes available, it's available to everyone, and so the -- this type of chemical composition data, it's available on places like FracFocus or whatever, are being evaluated by individuals.

And I put up a slide of a table that -- or a figure that was in a paper that was published about a year and a half, two years ago by Dr. Colburn (ph) and her collaborators, and they took this information right off of FracFocus, and then they went into the scientific literature, and they were able to identify adverse health effects that are associated with this specific chemical components that comprise frac fluids.

And as you can see from the slide, everybody can read it as well as I can, but they found that some of these chemicals are endocrine disruptors, some of them cause cancer, some of them are ecological -- pose ecological risks. But I'm -- say up on the top that it's information without context because while these compounds have some inherent toxicity, one of the things that we're most concerned about is whether people actually get exposed to them or not.

And as everyone knows, there's a -- and Briana mentioned it as well, there's a lot of water that goes down a well. Each well typically contains 1-2 million gallons of water, and if you saw from -- that's -- if you remember from that previous slide, only a small fraction of that volume that goes down a hole is actually comprised of frac fluids.

And so, the -- it's less than 1/10th of one -- I mean, it's less than one percent. But if you're looking at, for example, 0.44 percent of 2 million gallons that go down a well, you're still talking about almost 10,000 gallons of these chemicals that are going down the well. So, we have to place this exposure issue into some kind of context.

I think one of the other complicating issues is not only the volume of chemicals that might be placed into the environment, but I think it's sort of a unique feature of the fracking operation that the activity isn't occurring out in the rural environments anymore. I've been to several frac pads, and they're located in communities. And this is sort of an illustration. You can see a church there off in the distance, and a store in the foreground, and a -- it looks like a warehouse there.

So, there operations are being placed in close proximity to existing communities. And so, when you combine the location of these frac wells along with the information that's being provided to the community on -- in terms of the composition of the frac fluid, I think there's a natural concern by the public, and I -- it's really incumbent upon the industry that they get out and address these kind of concerns.

We're starting to see some information. Everyone has been talking about the potential for the frac fluids to make their way into the drinking water sources. And we're just now starting to see some information on whether this is really -- this type of event is really occurring. It's not theoretical anymore. It's -- we're actually getting some empirical data from around the country on whether the frac fluids are making their way into drinking water, which could potentially result in an exposure.

I've -- for example, there's evidence pretty conclusive from EPA that came out of Dimock just a couple of months ago where they went in and evaluated the groundwater in the area and came to the conclusion that there's not levels of contaminants that are currently in the local drinking water groundwater supply that require any action by the agency.

HILBERT:
Hey John, this is the moderator, Brun. Can you advance your slides?

SCHELL:
Yes, I just did. You should be seeing confusing data from EPA on Pavillion?

HILBERT:
Yes, that's what I'm seeing.

SCHELL:
Are you seeing it Brun? Brun?

HILBERT:
I'm not, but that's okay. You can move along.

SCHELL:
Okay. So in one instance, and Briana brought it up that Dimock was an area of real concern for the EPA because of concerns voiced by the public. So EPA came in and investigated it. And another area that EPA was interested in is in Pavillion, Wyoming. It doesn't appear that the information from Pavillion is

quite as clear.

And you'll note that I'm citing a report from API and another one from Bloomberg Business Week that, sort of, gives conflicting interpretations of the Pavillion data. I'm not citing USGS or EPA here because all that they did was essentially do a data dump. They reported the results of sampling in Pavillion, they sampled the same -- essentially the same wells, and they just reported out the data. There is no conclusions associated with the reports. And since there's no conclusions provided by the investigating organization, it's left to others to interpret it.

But the API evaluated the data that the USGS put out on Pavillion, and said that they didn't find any evidence that there are frac fluids, specific frac fluid components that are making their way into the wells. EPA had previously reported that they were detecting some, but on the follow-up study done just this year, the USGS in their data report -- the USGS didn't specifically report it, but in -- if you reevaluate the data, they're not seeing any of these constituents.

However, from the EPA data, again these are two separate reports, but they're essentially the same site. The EPA data could be interpreted to suggest that there is contamination in the groundwater well, and so that the fracking fluids are making their way into the system.

I think that the study that Briana was talking about the very comprehensive EPA analysis, and I would agree with her, I think this is going to be a really solid report. They've done a lot of outreach. And so, I think at the end of the day, when EPA gets done and reports their findings in a couple of years, it will really, I think, put this issue to bed in a lot of ways, on whether frac fluid -- fracking -- hydraulic fracturing, when it's conducted properly, whether there's a risk for contamination of drinking water supplies and hence, that potential exposure to the local community.

There's another area that is really gaining a lot of interest. And this is relatively new; it's in the last 18 months or so. And that is, in evaluating the error in the surrounding community that's associated with hydraulic fracturing activities. The Colorado School of Public Health conducted an error study, and it was a pretty comprehensive study, and there's a full report available. But not only have they developed this report, but they had a sort of a shorter version that was submitted, and it went through peer review, and it -- it's one of the few that's actually in the peer reviewed scientific literature.

And so, it provides us some really basic information and some of the first information that we're finding on whether there is concerns for air releases during the hydraulic fracturing operation. And I just briefly put up a schematic of the study design that these guys looked at, and it was a unique and pretty comprehensive study design in that they looked at the well during its construction, and the wells during the development or after the well had been completed, and that they were in the natural gas production process. And they also segregated the community into those that were living near to a well head and those that were living further away from it.

So, we're really seeing four different exposed populations; populations that were exposed acutely or short-term near a well, acutely far away from a well, and chronically or long-term near a well, and chronically away from the well.

HILBERT:
John, let me just jump in there and say for -- a question from one of the people out there was, how far away somebody should have a home near a well site? That study that you're talking about, it was one half mile was the ...

SCHELL:
Exactly.

HILBERT:

... distance that they made the measurements.

SCHELL:
That's correct, Brun. They considered, quote unquote, near the well as being within a half mile.

HILBERT:
Thanks.

SCHELL:
Sure. And this is a figure that is in the publication. And so, what we're -- what we can see here is that they looked at the hazards associated with exposure to constituents that they detected in the air, in areas near a well and far away from a well. And there are -- this is a -- the closest thing to an actual quantitative risk assessment that we have in the published peer reviewed literature right now.

And so, again as I mentioned, there are, sort of, four separate populations that were looked at; folks that were exposed chronically far away, and they didn't have any elevated hazards. I should point out that a hazard value, and I'm not going to get into the complicated equation that we used to derived these hazard indices, but if it's equal to one, it's a ratio, and your estimated exposure is equivalent to an exposure that the EPA considers as safe.

So, we see that the chronic far were below one, so it's considered safe. The sub-chronic or short-term far is also below one, and the chronic near actually worked out to be just at one. And that means that exposure to the constituents that they measured in the air is equal to the level that EPA considers safe. And the only one that really presented an issue in this study is those folks that live near a well, within a half mile, and are exposed to over a very short term.

Now, I'm not going to spend a lot of time on this study because we don't have a lot of time, but you do need to know that the way these were calculated, they used the maximum concentration that they detected in their sampling regime, and they also maximized some other things like the person who was exposed every day for 20 months, that was considered short-term and stopped (ph). So, they -- and the authors pointed this out, that this was really sort of a test of a hypothesis. And so, a lot more study needs to be done before anybody can reach some conclusions.

There's a recent study that's just been published in the -- again, in the peer review literature. As you can see, it's going to -- it was accepted in November of 2012. And this was really, as they point out, it's an exploratory study on air quality near natural gas operations. And it wasn't nearly as definitive as the Colorado School of Public Health study, it real quantitative in terms of estimating risks.

But again, it identified some constituents that appeared to be slightly elevated. And their conclusion was that this is something that needs to be studied. There's a lot of uncertainty, but it is something I'd think that from a toxicological risk perspective, needs some more work.

Now, as a I -- toxicologist and looking at all the different operations that go on in and around the well, the one thing that probably represents a substantial risk is exposure to workers; not to the general population, but to workers from proppant materials. And Tim, you mentioned before what were proppants. They're primarily sand, and they contain a lot of very fine silicas.

And so, NIOSH and OSHA conducted a study just this year -- again, I want to reemphasize what Brun talked about early in the presentation. There's a lot of stuff that's going on as we speak; just a lot of information.

So, they looked at 11 hydraulic fracturing sites at these states; Arkansas, Colorado, North Dakota, Pennsylvania and Texas. And they did some very quantitative assessments of the exposure to these workers. And they found some fairly -- they found some data that caused some concern, which is why

they issued the hazard alert that I pointed out on the previous slide. And they showed, just running through this briefly, about 50 percent of the workers are -- exceed an OSHA PEL which is a safe level, that permissible exposure level, so that half of the workers were being exposed to levels that are above those considered safe.

About 80 percent of them were -- had silica exposure greater than NIOSH's recommended exposure limit. About 10 percent were 10 times above the PEL, and about 31 percent of the -- those samples showed 10 or more times that their REL was exceeded (inaudible) like 100 times.

MCCRUM:
John, just to clarify, this is an area that is -- that is already the subject of federal regulation. Is that right? This is not an area that's -- where you -- it's unregulated ...

SCHELL:
Correct.

MCCRUM:
... situation.

SCHELL:
That's an excellent point, Tim. And so, these OSHA PELs and NIOSH RELs apply. And I want to emphasize again, these concerns are based for -- on silica exposure. Silica causes silicosis. There's a question whether it might cause lung cancer, but that's from chronic exposure.

So, if the community is exposed to these proppants, that they happen to drift offsite over a two or three-day period that it takes to frac the well, that's not what we're talking about here. We're talking about those workers that are exposed over and over again to these materials. So ...

HILBERT:
In addition -- in addition, this is Brun again, this -- that study does not include resin-coated proppants?

SCHELL:
Correct.

HILBERT:
Or ceramic-centered bauxite proppants as well?

SCHELL:
Yes. It was very specific to just the same proppants.

HILBERT:
Yes.

SCHELL:
That's a good clarification. So, just really -- I want to summarize real quick what we see so far from the early environmental sampling. And again, this is an area of pretty intense focus here right now, but in groundwater, I'd list it as inconclusive, but I would echo some of what Tim said earlier, that although we've

got thousands of wells that have been drilled throughout the country, there is very few, if any, documented evidence that frac fluids, the chemicals, these chemicals that can present a risk, are actually making their way into groundwater.

For air, we are seeing detectable levels of drilling-related compounds, and I can get into specifics later if there's a question about it, but the concentrations really don't appear to represent a health risk. Again, the Colorado study sort of maximized the exposure just to see -- it was really a screening effort. And -- but chronic exposure to silicon dust from proppants may present an occupational risk. And so, I think something needs to be evaluated for that.

And just real quick, I want to -- because we're running out of time, just to echo what Tim was talking about with regulations, these are headlines from inside EPA, which is an online news service. In the last three months, and I've highlighted how all of these different regulations and laws are being -- EPA is attempting to almost retrofit a lot of these laws to try to regulate the fracking industry without having to go through and develop a new regulation or a new law.

So, it is -- it's kind of interesting how all that is sort of developing.

HILBERT:
Okay.

SCHELL:
And then finally -- just real quick.

HILBERT:
Go ahead. Go ahead John. Sorry.

SCHELL:
Finally, there are concerns about health effects that may be associated with this kind of activity. We see it in the general literature. And that as I point out in the Epoch Times, which is an online journal, that they're reported that exposure to frac -- the fracking activities resulted in a 25 percent reduction in birth weight. The author of that -- the report testified before the New York Department of Health. This is not a published study. It hasn't gone through peer review, but it's the kind of thing we're seeing out in, sort of, the advocacy press.

There was another one that was in the Center Media and Democracy P.R. Watch that talked about down here in Texas, that there's an increased breast cancer rate. These are not classic epidemiological studies, but the information is making its way into the -- into the publically available literature. So, it is -- again, it's raising concerns to folks that are in the community.

So just real quick, to summarize, the fracking operation, the activity of classing hydraulic fracturing if I can call it classic since 1947, it does use a lot of chemicals, and puts them down a hole. And they are -- some of these chemicals have some inherent toxicity, but the industry has a pretty long track record of not creating environmental catastrophes with these -- with these kind of processes.

I really think the industry needs to continue to make sure that they follow best practices. I heard an attorney at one of the meetings we were at say it's not the -- it's not the process, it's the practice. So, fracking done properly doesn't really represent and environmental risk; again, if it's done properly.

And finally, EPA -- or excuse me, the -- I -- there is a, I think, an occupational risk that needs to be evaluated from these fracking operations, especially for some of these guys that are -- go to multiple wells over in a pretty extended period. And finally, EPA regs are coming; just not sure when and how they're going to be implemented. And with that, I'll turn it back to Brun.

HILBERT:
Okay. We don't have a whole lot of time here left. We'd like to answer some questions. I think if we don't get to answer questions remaining on the list, then we can do that by e-mail. And we'll follow up with that. Let's see, are you all -- are the rest of the panelists able to see any of the questions?

MCCRUM:
Yes.

SCHELL:
Yes.

HILBERT:
I'm going to take a quick crack at one of the first ones on the radionuclides, naturally occurring radioactive materials. It's not specific to hydraulic fracturing. That's from the produced water. That's always been a problem in producing oil and gas wells, and has to be separated out. It's not specific to hydraulic fracturing, but it is -- it does come up when we do the flow back operations.

Let's see here. Briana, there was a couple of questions here related to seismic risk. One of them was, geothermal industry has found that seismic risk can be managed by conducting good site characterization. I think that's correct. Do you want to have some comments about that?

MORDICK:
Sure. Yes. So, the additional question after that was do state oil and gas regulations, or the regulations that oversee the underground disposal injection of hydraulic fracturing produce water specifically require site characterization that addresses seismic risk. The answer is no. It's pretty much completely absent from state regulation. I'm not aware of any state that requires geologic characterization to quantify or assess seismic risk.

There are certain classes of underground injection disposal wells that do require analysis of site-specific geology to analyze seismic risk, but those are class six wells, which are used for the injection of carbon dioxide for geologic sequestration, and class one hazardous wells which are used for hazardous -- disposal of hazardous waste. The -- or the class of well that's used for produced water are class two wells, and seismic site characterization to quantify or address seismic risk is not required under class two.

HILBERT:
I have one for John here. Can you comment on the fine particulate exposure and NOx from diesel truck traffic in communities?

SCHELL:
That's a great question. EPA recently reclassified exposure to diesel exhaust as a known human carcinogen. But again, it -- a lot of it has to do with who it is that we're talking about. If you're talking about workers on the pad in close proximity to the origin of where this material is coming from, there could be associated risks, and that's something that I know NIOSH talked to some individuals at NIOSH that they're looking into that.

But as it disperses, the actual -- although it's very limited, the information we have offsite, because of the wind dispersion and things like that, it's not a lot different from living in relatively small communities. It's not even as bad as living in places like New York or major urban settings. So, it's something that the health community is looking at. And again, this is a worker issue and not a general public issue.

HILBERT:
And for Tim, there was a question here about the written materials from the first presenter. Had bullets three, common law, due to regard to surface owners et cetera, et cetera, that's a legal question ...

MCCRUM:
Yes.

HILBERT:
... that you ought to address.

MCCRUM:
Yes. I'll be glad to take a crack at that. The question was to comment further on the common law concepts of due regard to surface owners and how oil and gas operators do have common law obligations with regard to nuisance and trespass doctrines. And first, where you have a split mineral estate, which is common in the Appalachian area, not universal but relatively common that you have a different surface owner as opposed to the owner of the mineral estate, the mineral estate owner has a long recognized obligation to show due regard to the surface owner and to make reasonable accommodations to the surface owner to minimize impacts on the surface estate.

And if that -- if the surface owner believes that that's not being recognized, the surface owner typically has the right to bring a common law action to restrict the oil and gas operator's activities. And the oil and gas companies have every incentive to avoid that type of claim and make accommodations with surface owners

And a similar consideration comes into play with neighboring property owners with regard to potential common law claims of nuisance and trespass if you have contamination of surface waters from any aspect of oil and gas activity, whether it's sedimentation from roads. Anything of that nature would -- you know, the companies have every incentive to minimize those effects apart from regulation, but -- and also to be -- to have follow -- good neighbor policies and avoid those types of common law claims.

Water rights is a broader topic than I can hope to get into now, but you have well-established water rights, doctrines in the western states, and the east, your variations among those regions that reflect how, you know, the variations in limited water supplies in the west. But you have existing legal doctrines in place that provide rules and standards for companies operating.

HILBERT:
Well, gosh. It's 11:02 according to my computer here. And I appreciate all of the panelists' great discussion, and slides, and technical expertise. And I think we're about ready to close for the day. I appreciate the questions, and we'll get back to these questions by e-mail. We'll sort that all out here shortly after we're done with the phone call. So, thank you, and I'll throw it back to the operator.

OPERATOR:
Thank you. Thank you for joining us for today's ALI CLE and ELI telephone seminar and audio webcast, Hydraulic Fracturing Science Update and Frontiers. Participants will receive an e-mail from ALI CLE requesting completion of an evaluation from, and specific information on obtaining continuing education credits. Thank you for attending. This will conclude today's program.

CQ Transcriptions, Nov. 29, 2012
List of Speakers
R. TIMOTHY MCCRUM, PARTNER AT CROWELL & MORING LLP

BRIANA MORDICK, STAFF SCIENTIST AT THE NATURAL RESOURCES DEFENSE COUNCIL

JOHN SCHELL, PRINCIPAL SCIENTIST IN TOXICOLOGY & MECHANISTIC BIOLOGY AT EXPONENT

L. BRUN HILBERT, PRINCIPAL ENGINEER AT EXPONENT

CQ CONGRESSIONAL TRANSCRIPTS
Congressional Hearings
Nov. 30, 2012 - Final
House Science, Space and Technology Subcommittee on Energy and Environment Holds Hearing on U.S. Energy Research and Development
LIST OF PANEL MEMBERS AND WITNESSES

HARRIS:
The Subcommittee on Energy and Environment will come to order.

Good morning, everyone. Welcome to today's hearing entitled, "Tapping America's Energy Potential Through Research and Development." In front of you are packets containing the written testimony, biographies and truth in testimony disclosures for today's witness panel. I now recognize myself for five minutes for an opening statement.

Let me begin by noting that this is expected to be the last Energy and Environment Subcommittee hearing of this Congress. I'd like to thank Ranking Member Miller and the members of the subcommittee for working together to consider and address issues of great importance to the future of our country. As we have highlighted throughout this Congress, the U.S. has a wealth of untapped, unconventional energy resources. In fact, the International Energy Agency recently predicted the U.S. will overtake Saudi Arabia to become the world's largest oil producer by 2020, largely due to the potential for development of U.S. unconventional energy resources.

The significant positive economic benefits associated with development of unconventional energy resources are widely acknowledged. Tapping America's unconventional oil and gas resources will additionally provide sorely needed stimulation of our economy, restore our manufacturing sector, and create high paying, middle-class jobs. CitiGroup predicts the cumulative impact of new oil and gas production could create as many as 3.6 million new jobs by 2020. Unfortunately, the degree to which the U.S. will pursue and realize these much-needed benefits remains in doubt, primarily due to politics.

Under Chairman Hall's leadership, the Science, Space and Technology Committee and this subcommittee in particular, has explored a broad range of energy production related issues, from the lack of transparency and weak scientific foundations underlying EPA's job killing regulations, to the waste and imbalance in the Department of Energy's research and development activities. Unfortunately time and again, a massive disconnect between the president's words, and his administration's actions are evident. While President Obama continues to claim he supports an all of the above energy strategy, the plain facts tell a different story.

This was clearly illustrated in May when DOE's assistant secretary for fossil energy testified to this subcommittee that oil shale was a component of the administration's all of the above energy strategy, yet when pressed, he acknowledged that DOE was not spending any funding on oil shale R&D, and could not identify anything the administration was doing to actively advance oil shale. In fact, despite the president's common call for an all of the above energy strategy, in this year's State of the Union speech just recently

the administration finalized a plan effectively reducing lands available for oil shale production by two-thirds.

Unfortunately the administration's rhetoric on energy production is similarly empty when it comes to shale gas and hydraulic fracturing, where the EPA is leading 13 federal agencies and offices in pursuit of new ways to regulate this incredibly beneficial and safe technology. Chairman Hall's legislation for tapping energy -- tapping America's energy potential through the Research and Development Act of 2012, addresses the above obvious imbalance in DOE research priorities. It restores a true all of the above R&D focus at DOE, through authorization of limited, and targeted research and development activities that develop key technologies relating to oil shale, shale oil and gas, and produce water utilization.

At this time I'd like to yield to the chairman of the Science, Space and Technology Committee for three minutes, for him to describe his legislation. Chairman Hall?

HALL:
Mr. Chairman I thank you very much.

And you've done a very good job of -- of your opening statement. You just about said it all, so I say to you good morning, and -- and I thank you for yielding this -- the time you've given me. I want to thank the witnesses for being her to talk about an issue that's very important to me, and to all of us and in particular I'd like to recognize and thank Dr. Daniel Hill, the chair of the Texas A&M Petroleum Engineering Department. And I had a good visit with your president two Saturdays ago, I think when they created Johnny Football down there. And we're waiting to see what they do with it.

And Dr. Martineau, the chairman of the Texas Independent Producers and Royalty Owners, TIPRO, a great organization that I'm very familiar with.

And I think that you started out with Frank and Shelby Pitts, and they're still with the organization, is that correct?

MARTINEAU:
(OFF-MIKE)

HALL:
Well, you're probably getting too old to do things like that.

(LAUGHTER)

HALL:
But energy policy, this has always been one of my very top priorities, both as a member, and as chairman of this committee.

I strongly believe that for young people today, the importance of energy and how important energy is, and the fact that nations, including our nation, will fight for energy if we don't have energy, and we shouldn't have to, because we have plenty. And I'm very hopeful for this next two years that we can use what we have and be users of our own and (inaudible) will have in addition if we just do what we ought to do like "all of the above." A lot of people talk "all of the above" and do "none of the above." That's what our problem is.

But in some ways, I think (inaudible) energy is probably the most important word in the dictionary for youngsters that are graduating from high school, grade school and college. It's the foundation upon which our nation has prospered and it's the key to our quality of life and standard of living. That's why I introduced H.R. 6603, which would increase energy security through support for research and development to enable a prudent development of U.S. domestic energy resources. The legislation builds

on the record of the Science, Space and Technology Committee during our tenure here this last two years.

The U.S. is blessed with a wealth of unconventional energy resources, and we're currently experiencing a revolution in oil and gas production thanks to those resources. This increased production is not only increasing our energy security, it's stimulating our economy and creating much-needed jobs. In 2010, unconventional natural gas development alone supported over 1 million jobs in this country, and this number is expected -- and could more than double by 2035.

This bipartisan legislation promotes the development of oil shale, instead of restricting it and ensures that we maximize the benefits of our own conventional oil and gas resources. The bill directs the Department of Energy to undertake R&D activities to address the scientific and technological barriers to oil shale development.

It also supports R&D to minimize water use and maximize efficiency in shale oil and gas operations. The legislation includes language from the Reduced Water Utilization Act, a bill I sponsored and others of us sponsored in the 111th Congress and passed through the House with unanimous consent.

In 2005, we worked together, and I did author section 999 of the Energy Policy Act, which created a very successful Department of Energy Unconventional Oil and Gas Research and Development Program.

It's -- the bill before us today is intended to complement the ongoing 999 program, which was a program that we knew energy was there in the Gulf, but we couldn't get it up -- couldn't get it to the top. We needed technology to get it to the top. We traded to a lot of universities. They'd give us the technology. We'd pay them with the energy they got to the top. If we didn't get their technology, it didn't go to the top. If we did get their technology, it did. And this worked very well.

They take shots at it every year, but it's so valuable that I'm hoping -- it's currently set to expire in 2014, and I hope they're going to continue beyond that, and I think they will, as well as provide direction for the DOE oil shale R&D activities and the administration's proposal for an interagency R&D collaboration on unconventional energy resources.

HALL:
The only thing that can stop this amazing story from continuing is politics, specifically Environmental Protection Agency's thinly veiled campaign to restrict access to these resources.

In closing, I'll just say the bill I'm introducing today will help to provide the check against EPA's war on energy by addressing environmental challenges through technological solutions, instead of job-killing regulations.

I'd like to ask unanimous consent to enter into the record a letter from the American Geo-Sciences Institute in support of H.R. 6603, and I look forward to hearing from our witnesses today. And I yield back. And Mr. Chairman I ask that unanimous consent to enter into the record that letter.

HARRIS:
Without objection.

Thank you, Chairman Hall.

And Mr. Chairman, it's, of course, been a pleasure to work with you the last two years. And I realize that -- that the room has been brightened up a little bit by a new picture hanging on the wall opposite the chairman's -- chairman's podium here.

Yeah, that -- that's appropriate.

(APPLAUSE)

So...

HALL:
Senator (ph) (inaudible) something about it...

(CROSSTALK)

HARRIS:
I'll yield -- I'll yield to the chairman...

HALL:
I don't know how long it took him to do it, but he looked at me for about an hour and a half, and then took a thousand pictures, and then, he brought the picture in a box down to my house in Rockwall, and he opened it up and I said, "Oh my God," I looked at it, and I said, "It's terrible." He said, "Well I have my things here, I can touch it up. What -- what is your problem with it?" I said, "Well I don't think you can -- I don't think you can improve on it."

He says, "I can -- I can do whatever you ask me to do. What is your problem with it?" I said, "Well, the main problem, it looks just exactly like me."

(LAUGHTER)

Anyway, he eased up a little bit, but he did a good job. And thank you Mr. Chairman.

HARRIS:
Thank you, Mr. Chairman -- Chairman Hall.

I want -- I want to again thank the witnesses for being here today, and now yield to the ranking member Mr. Miller for an opening statement.

MILLER:
Thank you, Mr. Chairman.

Before I begin, I would like the opportunity to welcome our newest member David Curson. Congressman Curson occupies the state (ph) left by Thaddeus McCotter, representing the 11th District of Michigan. He -- he will not be a member of the new Congress. So he will probably not have the opportunity that Thad McCotter had to impress us with his distinctive personality.

He brings his long experience though as a member of the United (inaudible) Workers leadership, and has a technical background in manufacturing, which is a welcome addition to -- to this Congress. So we -- we do welcome him.

Mr. Chairman, we obviously have a disagreement about what would constitute an all of the above energy policy. The lesson for today's hearing is from the book of Matthew, "For to the one who has -- who has what will be given, and he who will be -- and he will have an abundance and from the one who has not, even what he has will be taken away."

The way many Americans put it colloquially, "them that has, gets." That has certainly been the Republican policy on energy research. Our efforts to assist emerging energy technologies, like solar, geothermal, wind and technologies to make energy use more efficient, are considered green pork, to House Republicans. They have opposed efforts by the Department of Energy to promote research, demonstration projects, commercialization of emergent -- emerging technologies as picking winners and losers.

The Republicans -- the Republicans views and estimates for fiscal year 2012 gave deeply principled reasons for oppositions to government investment in emerging -- in energy technologies.

And I quote, "Fundamentally, the act -- the act of providing individual firms with government money for the purpose of commercializing profitable technology is an inappropriate intervention in the market that may crowd out or discourage a greater amount of private investment."

MILLER:
So, for emerging technologies, that have not -- that have not the economic and political power of incumbent fossil fuel and nuclear technologies, even what they have will be taken away. But, incumbent technologies, which are already enormously profitable will be given more and will have an abundance with none of navel gazing discussion about picking winner or losers or inappropriate interventions in the market.

The incumbent technologies had benefited from government research for generations, government subsidies for -- for generations including research.

Hydraulic fracturing is a combination of technologies developed by federally funded research. We will obviously continue to depend on fossil fuel technologies for most of our energy well into the future, many Democrats including me have supported government funding for fossil fuels research and will likely support this legislation as well.

In a section of -- of Chairman Hall's legislation on produced water is almost identical to legislation passed by the Democratic majority in the last Congress.

The industries in (inaudible) of specific individual firms that will benefit most directly from this legislation. Already have far more public and private investments in applied research, in commercialization of technologies and new firms developing alternative energies and technologies so of which may dramatically offer energy future and some of which may -- may never be commercially viable.

Even more important, continued support in abundance for incumbent technologies often to the exclusion of alternative technologies continues to base our energy future almost exclusively on (inaudible) fossil fuels to extinction leaving us woefully unprepared for our longer term energy needs.

Mr. Chairman, I suspect that most Democrats will support this legislation when it comes to a vote but I hope that Republicans will consider whether the arguments to support this legislation would be equally applicable to research for alternative energy forces so -- so that we can have truly in all of the -- the above energy policy.

I yield back the balance of my time.

HARRIS:
Thank you very much Mr. Miller and I join you in welcoming Mr. Curson to the Science, Space and Technology Committee and I welcome him sitting in on the subcommittee hearing today.

If there are members who wish to submit additional opening statements, your statements will be added to the record at this point.

At this time, I'd like to introduce our witness panel. Our first witness today is Dr. Anthony Cugini. Dr. Cugini is the Director at the National Energy Technology Laboratory for the Department of Energy. He previously served as Director of the Office of Research and Development at the National Energy Technology Laboratory.

Before that position, Dr. Cugini served as the Focus Area Lead for NETL's Computation and Basic Sciences Focus Area. He's been at the Laboratory since 1987.

Our next witness is Dr. David Martineau. Dr. Martineau is the Chairman of the Texas Independent Producers and Royalty Owners Association.

Mr. Martineau has worked in the oil and gas industry for more than 50 years. He's an active member of

the American Association of Petroleum Geologists, the Interstate (ph) Oil and Gas Compact Commission and the Barnett Shale Water Conservation and Management Committee.

Our third witness is Dr. Daniel Hill who is the Interim Department Head, a Professor and Holder of the Noble Chair in Petroleum Engineering at Texas A&M.

Previously, he taught for 22 years at the University of Texas at Austin after spending five years in industry. He's the author of a society petroleum engineering monograph production logging, theoretical and interpretive elements, coauthor of the textbook Petroleum Production Systems, coauthor of an SBE book Multilateral Wells, and author of over 150 technical papers and holds five patents.

Our final witness is Dr. Michael Hagood -- Mr. Michael Hagood. Mr. Hagood is the Director of Program Development for Energy and Environment Science and Technology at the Idaho National Laboratory.

He's responsible for developing programs, advancing energy innovation and also for designing and implementing INL's regional energy sector strategy, notably the Western Energy Corridor Concept.

Mr. Hagood joined INL in 2003 and previously has also supported INL national and homeland critical energy infrastructure programs.

Thank you all for appearing before the subcommittee today.

As our witness should know, spoken testimony is limited to five minutes each, after which the members of the committee will have five minutes each to ask questions.

I now recognize our first witness, Dr. Anthony Cugini, the Director of the National Energy Technology Laboratory at the Department of Energy for five minutes.

CUGINI:
Thank you.

Chairman Harris, Ranking Member Miller and members of the subcommittee, I appreciate the opportunity to -- to discuss the role that the Department of Energy's Office of Fossil Energy and National Energy Technology Laboratory continue to play in the safe and responsible development of the nation's unconventional oil and natural gas resources.

As you know, since 2008, U.S. oil and national gas production has increased each year. In 2011, U.S. crude oil production reached its highest level in nearly a decade. Natural gas production grew in 2011 as well; the largest year over year increase in history.

Overall, oil imports have been falling since 2005 and are dependent on imported oil decline from 57 percent in 2008 to 45 percent in 2011, the lowest level since 1995.

There are a number of unconventional resources with the potential to support the president's all of the above strategy and to further reduce U.S. reliance on foreign oil. These include U.S. oil reservoirs amenable to CO2 EOR, heavy oil, oil shale, shale oil and natural gas resources to include methane hydrates.

Studies indicate that 24 billion barrels of residual oil may be recoverable with current CO2 EOR technologies and another 36 billion barrels with next generation technology.

For perspective, the U.S. currently produces about 2 billion barrels crude oil per year and has crude reserves of about 23 billion barrels.

The National Coal Council estimates there's another 33 billion barrels of residual oil (inaudible) oil is recoverable at a crude oil price of $85 per barrel.

In combination with oil shale, heavy oil, oil sands and shale oil, EIA estimates that unconventional oil resources totaled more than 3,000 billion barrels of liquid hydrocarbons in place.

Production of unconventional natural gas resources has also risen sharply during the past decade. Shale gas in 2012 in the U.S. is roughly 25 times what it was in 2000. EIA estimates that 482 trillion cubic feet of unproven but technically recoverable natural gas exists, more than 2011 annual natural gas consumption of 24 trillion cubic feet.

Even more (inaudible) shale gas is natural gas from methane hydrates. The Bureau of Ocean Energy Management regulation enforcement estimates in place gas hydrate resources of 21,400 trillion cubic feet in the Gulf of Mexico and the USGS estimated 85 trillion cubic feet on the North Slope of Alaska.

Implicit in the development of our unconventional oil and gas resources is that air and water quality and public health and safety are not compromised. To this end, the department has signed a Memorandum of a Agreement with the EPA and the USGS to address the potential environmental health and safety impact of hydraulic fracturing and the development of other unconventional fossil resources.

The DOE's NETL is also carrying out research to quantify and understand the risk of shale gas and shale oil development, as well as improved related unconventional oil and gas characterization and extracting -- extraction technologies under Section 999 of the Energy Policy Act of 2005, the altered deep water and unconventional natural gas and other petroleum resources program.

Just this week, the selecting of 15 new projects was announced as part of the Section 999 program.

Regarding methane hydrates, DOE's efforts have featured extensive interagency coordination and collaborations with leading international gas hydrate research organizations. Because these -- because of these efforts, hydrates have moved from a scientific curiosity in 2000 to a known resource today.

DOE and NETL have a long history of success in unconventional oil and gas research. Collaboration with industry in the 1970's and the 1980's was a lynchpin in the current shale gas revolution. Recent successes include completion of a large-scale field test of natural gas extraction from methane hydrates on the North Slope of Alaska.

Also (inaudible) Incorporated will open two commercial water treatment facilities this year in Pennsylvania based on technology demonstrated under DOE's oil and gas program.

NETL also conducts onsite research that compliments this (inducible) portfolio and it leverages competencies and capabilities including expertise in resource characterization, technology development and environmental monitoring to inform responsible sustainable exploration and production of the nation's unconventional domestic gas resources.

Let me conclude by saying that the U.S. contains significant hydrocarbon wealth that can be extracted and used to provide economic benefits for all Americans. The department is committed to developing the science and technology that will allow the nation to use its abundant fossil energy resources in a way that balances the energy needs for sustaining a robust economy with continued environmental responsibilities.

I recognize that you've developed legislation (inaudible) supporting unconventional oil and -- oil and gas research and while we have not developed the position, I am pleased that this legislation is focused on this important energy resource.

Mr. Chairman, this completes my prepared statement. I look forward to addressing any questions that you or the other subcommittee members may have.

HARRIS:
Thank you, Dr. Cugini.

I now recognize our second witness, Mr. David Martineau, the Chairman of the Texas Independent

Producers and Royalty Owners Association.

MARTINEAU:
Thank you very much.

Good morning Mr. Chairman and members, my name is David Martineau and I'm representing the Texas Independent Producers and Royalty Owners Association, also known as TIPROA. TIPROA was founded in at an East Texas field in 1946.

Since then TIPROA has grown to be a top tier oil and natural gas trade association made up of over 2,500 members statewide. Our membership ranges from small family owned businesses to large publicly traded independent producers and includes large and small royalty owners, mineral owners and (inaudible).

I currently have the pleasure of serving as the Chairman of the Board of TIPROA. I'm -- I'm a geologist, worked for Pitts Oil Company for 40 years as we said and I'm truly honored to be here.

Lately much has been made of this country's looming fiscal cliff, the United States, however is not only facing a fiscal cliff, but an energy cliff as well. Domestic (inaudible) producers are responsible for approximately 75 percent of the domestic natural gas production and nearly 50 percent of the domestic oil production.

However, threats to the framework that allows independents to maintain and grow their production levels exist in various forms.

One, tax provisions like intangible drilling deductions, IDCs, the (inaudible) are crucial to the survival of the small independent producer and they are being taxed and mislabeled as big oil subsidies.

Overreaching regulations from the EPA and U.S. Fish and Wildlife Service with no scientific backing additional unnecessary compliance cost on the oil and natural gas producers.

The federal government is attempting to go green and pick winners by focusing federal research and development moneys on unproven, uneconomical and unreliable sources.

They will not face the fact that 85 percent of the energy in the U.S. comes from fossil fuels. What needs to be done to continue to tap the American energy potential has been created by the new shale revolution.

MARTINEAU:
You need to, one, understand variations in subservice properties to avoid drilling in marginal wells and increased recovery efficiency, scientifically characterized risk and informed stakeholders, minimize surface impacts on the unconventional oil and gas operations.

In the past, federal dollars have been spent on researching and developing improved methods of oil and gas extraction. Much of the results and data and techniques combined with the forward thinking of some brilliant and creative private sector minds, resulted in some of the biggest energy successions in the country's history.

Let me outline a few specific cases of worthwhile federal research conducted on oil and gas.

In 1976, the U.S. Department of Energy initiated an Eastern Shale Project to evaluate the gas potential and enhanced oil production from shale within the Appalachian, Illinois and Michigan basins in the U.S.

This project showed that we have enormous amounts of natural gas locked in these domestic shale formations, which are now the Massey, Marcellus, and Utica shale plates.

In 1982, the federal government began funding research efforts of the Gas Research Institute, an industry formed research and development program founded in 1978, which has since resulted in increased natural gas viability as a fuel source.

In 1991, George B. Mitchell, the father of the Barnett Shale, with financial help from the Department of Energy, drilled and completed his first Barnett Shale horizontal well.

In 2005 the Energy Policy Act and a research program managed with the Research Partnership to Secure Energy for America called RPSEA has been a very successful program.

Recognizing the importance of oil and natural gas, and investing federal money in its development, should not be a thing of the past. In fact, never in history has it been more crucial to continue improving and enhancing our ability to recover domestic oil and natural gas.

Domestic energy independence can be achieved, and federal research money can play a part. In the state of Texas alone, since the shale revolution started in 2006, from 2006 to 2011, we have increased annual production of oil from 347 million barrels to 431 million barrels, and natural gas from 6.3 trillion cubic feet to 7.7 cubic feet. This partially is why our imports have dropped from 70 percent to 45 percent in the same time period, and -- as we head towards energy independence.

Chairman Hall's bill, 6603, is a good step in the right direction, and I compliment him for his efforts. Many areas where additional research could produce significant results are outlined in the bill, including hydraulic fracturing, development of improved proppants, water minimization, management and reuse alternatives, improved modeling of formations, energy efficiency and exploration production. Hydraulic fracturing, a big item. The hydraulic fracturing process as it has evolved over the past 50-plus years from vertical wells to long horizontal wells with multiple fracture treatments has introduced many complexities.

There is a need for research focus in this area to increase recovery efficiency. To do so requires focusing on the sub-surface process involved with fracturing, including modeling of the process, micro seismic assessments, emissions, water usage, and other research. Successful research will increase the efficiency of the process, significantly reducing the number of wellbores required, resulting in a reduction of well sites, water usage, emissions, traffic, noise, dust, and other factors, all while increasing oil and gas recovery per well.

This area of research, the optics of which do not indicate direct environmental impact, can be an overwhelming environmental impact. Look, water management is another big issue. According to the data collected by the Texas Water Development Board, the volume of water used in hydraulic fracturing represents less than one 1 percent of all the water consumed in the state of Texas. However, water management goes hand-in-hand with hydraulic fracturing, and the industry recognizes there is still progress that can be made in this arena.

Research and development are needed to address mitigation of the volumes of fresh water required in hydraulic fracturing. Significant volumes of water produced from oil and gas shale and associated concerns as to its composition when it comes back. The development of technology to process water, converting the industry's largest waste stream into a new, useful product, and assuming the ability to safely dispose of water in the sub-surface of the geologic characterization of potential disposal zones across the country, because they vary from basin to basin.

Understanding the sub-surface. The sub-surface geologic conditions and types of resource rocks found in unconventional formations, in particular oil and shale, require ongoing research. Flow of fluids; gas, oil and water, through the low permeability formations, particularly oil and gas shale, is not well understood. By increasing our understanding of sub-surface geologic conditions, we can make progress toward effectively answering questions regarding economic recovery, and environmental safety. Additionally sub-surface research can increase recovery efficiency for many unconventional and conventional oil and gas fields in the U.S., further unlocking minerals yet already in place.

These development fields each have entire infrastructures in place with roads, wellbores, metering facilities, marketing. Thousands of small independents, many of whom are TIPRO members, do not have resources to conduct their own research, yet cumulatively produce a huge portion of domestic oil and natural gas. This is an area where targeted, and carefully disseminated federally funded research efforts

can have a significant, and immediate impact on production and the economy. And I urge you to revive federal research investments into this worthwhile industry.

Often efforts intended to impact major global oil and natural gas companies, end up having a much larger impact on small family owned businesses, many of which live and work in your hometowns. These companies are a giant component in creating American jobs and resources for your state, and this country, and they are worthy of your investment.

Thank you for your time.

HARRIS:
Thank you very much.

I know recognize our third witness, Dr. Daniel Hill, the interim department head and professor, and holder of the Noble chair in petroleum engineering at Texas A&M.

Dr. Hill?

HILL:
Good morning chairman and committee members.

I am Dan Hill. I'm the head of the Petroleum Engineering Department at Texas A&M. I've been a faculty member for over 30 years, after working in industry for about five years. And throughout my career, I have conducted research on methods to improve oil and gas production. For the past 10 years, I've been supervising research projects funded by the Department of Energy. That is, horizontal wells, and hydraulic fracturing. Unconventional oil and gas production has changed the U.S. energy game.

In just a few years applications of advanced technology have led to the most dramatic economic boost our country has seen in my lifetime. Production of natural gas and oil from unconventional reservoirs, primarily shale formations is soaring, daily lessening this country's dependence on imported oil. Slide one is a history and forecast of the U.S. natural gas supply. In less than 10 years, gas production from shale formations has grown to over 30 percent of U.S. supply, and continues to grow. This is great news in every possible way. Natural gas is the cleanest burning fossil fuel, it yields the least CO2 and it is low cost thanks to its new found abundance in unconventional reservoirs.

Even more dramatic is the rapid increase in domestic oil production from unconventional reservoirs. Slide two shows that oil production from the Bakken Formation in North Dakota is now close to 500,000 barrels per day. Forecasts are that Bakken production will reach a peak of 1-2 million barrels per day, equivalent to the peak production from the Alaskan North Slope. Production from the Eagle Ford formation in South Texas, has grown from about 800 barrels per day, to almost 300,000 barrels per day in only three years, as you see in this slide.

These are just two examples. There are many other unconventional reservoirs in other parts of the country that are also rapidly adding to domestic production. Without question, there is a revolutionary change in U.S. energy supply underway, solely due to oil and gas production from unconventional reservoirs. Now how has this happened? This shale production revolution is a result of major advances in the technologies of horizontal drilling, and hydraulic fracturing, and in particular, the combination of these two technologies. These advances have been aided greatly by a modest level of research funding from the Department of Energy, funding that supported research primarily at universities, small businesses, and the national laboratories.

Let me give you one example. Beginning in the early '80s, and through the mid '90s, the Department of Energy, along with the Gas Research Institute supported fundamental research on measuring the sounds made as hydraulic fractures are created. This research, led by a team and Sandia National Laboratory, resulted in a commercial technique for mapping hydraulic fractures that his now called micro seismic monitoring. This technique, which has now been applied to tens of thousands of fracture treatments, and which is now itself a multi-million dollar industry, has allowed lab engineers to greatly improve hydraulic

fracturing and well completion practices, by providing a means to measure the extent of the fractured region.

Slide four shows a micro seismic map of the area affected by multi-stage fracturing operations. The development of micro seismic monitoring of hydraulic fracture treatments was clearly enabled by the Department of Energy funded research that proved its viability. Is the current domestic energy's growth sustainable? The goal of energy security, and possibly energy independence for the United States is no longer just political rhetoric, but is technically obtainable. However, it will not be easy, and it will require two things: Further developments in technology, and the trained engineers and geoscientists needed for continued growth.

On the technology side, although hydraulic fracturing methodologies have obviously been developed to the point that oil and gas economic -- are economically recoverable from very low permeability unconventional reservoirs, there is still a great deal of improvement that can be made to this technology. Major challenges include using less fresh water in fracturing, and drilling fewer wells to contact the same amount of reservoir. The Department of Energy has been funding fundamental research in conjunction with the Research Partnership to Secure Energy for America, or RPSEA, on topics like these for the last several years. And this research is having a visible impact on industry practices.

It is important to continue supporting RPSEA, as they have a proven track record of producing important research results using a unique public/private partnership model. Perhaps most important is that Department of Energy funding for unconventional oil and gas research will have on the training of the engineers, and scientists needed to sustain growth in unconventional oil and gas development. The research funded by DOE occurs primarily in universities, and most of the money ends up in the pocket of graduate students.

The research funding provided to universities through the proposed Department of Energy Research Program will help support the graduate students who will become the future technology leaders of our country. Thank you.

HARRIS:
Thank you very much.

I now recognize our fourth and final witness, Dr. Michael Hagood, the director of program development for energy and environment science and technology at the Idaho National Laboratory.

Mr. Hagood?

HAGOOD:
Chairman Harris, Ranking Member Miller, and members of the subcommittee, thank you for the opportunity to testify before the House Science, Space, and Technology Subcommittee on Energy and Environment.

HAGOOD:
I have been asked to provide a statement on aspects of U.S. oil shale resource development, and the importance of associated research development and demonstration. The U.S. oil shale resource is immense in size with most of the resource located in the states of Wyoming, Utah and Colorado.

Estimates from recent U.S. geological survey studies indicate that among these three states, approximately 4 trillion barrels of oil are estimated to be in place with a significant portion of this resource projected to be recoverable.

To put that in perspective, some of those estimates are at 800 billion barrels of oil. The further put that in perspective, given 2011 estimates the use of oil in the United States is approximately 6.8 billion, it's enormous.

A viable oil shale industry established on the foundation of these world-class Western oil shale resources

would help meet U.S. energy demands, and reduce dependence on selected imports, and their associated costs as well as reduce the risks associated with potential supply disruptions.

On top of that, as already mentioned previously, this also has implications relative to the U.S. economy, and not just directly, but also in moving up the value chain associated with manufacturing.

An oil shale research development demonstration program can contribute significantly to unlocking some of the richest portions of the Western oil shale resource, and help achieve this in an environmentally responsible manner.

Government, and industry research development and demonstration investment in the Canadian oil's hands, and previous U.S. and current U.S. government investment in shale gas and oil development attest to the value of -- of RD&D in developing unconventional fossil energy resources.

In addition, several industry players are currently conducting R&D demonstration projects as part of the oil shale research development and demonstration leasing program managed by the Department of Interior Bureau of Land Management.

While a U.S. oil shale industry will likely be initiated with current technology, such as with mining and surface retort, aggressive research development demonstration is also needed to explore in advance new approaches in innovation. Research develop demonstration offers to expand technology options, improve operability and efficiency, mitigate potential environmental impact, and reduce cost of producing oil shale.

The objective of a potential oil shale research development demonstration program should be to provide solutions that help achieve specific production and environmental performance goals.

Such a program would have a near term objective of supporting responsible development of an oil shale industry, but also be sufficiently far sighted to anticipate and promote multiple mixed generation technology advancements. Given the longevity of this resource, that's something important to keep in mind. This resource could last 100 or more years.

An oil shale research development demonstration program should focus on challenges that exist at both a sight operation scale, and those that occur at industry-wide scale, including addressing fuel logistics, integrated energy systems, and address potential cumulative environmental affects. Relative to energy systems, these can include integration of renewable energy, or even nuclear energy, with fossil energy developments.

Research development and demonstration associated with site operations should include enhancing production efficiency and environmental performance associated with (inaudible) processing.

Addressing environmental performance, both at regional and operation scale, needs to address surface and ground water management, air quality, green house gas, wildlife and land disturbance challenges.

An effective R&D program should be guided by a strong strategic plan, developed working with diverse stakeholders and implementing R&D road map to ensure that the key research needs are identified and prioritized. Such a strategy can be built upon work already completed by U.S. Department of Energy in supporting implementing Energy Policy Act 2005 Section 369.

Planning should also take advantage of decades of relevant research conducted in association with the Canadian oil sands, as well as what is transpiring recently as part of the Department of Interior's oil shale leasing program.

This effort should also incorporate assets and expertise that have emerged around Western oil shale operations and research, including by industry, regional universities, government agencies, and laboratories.

The U.S. Department of Energy is a technical integrator that can bring together needed assets from both

within and outside ideally to deliver impactful RD&D programs, and can also act as an independent broker of technical information.

DOE and its laboratories are well qualified for (inaudible) this leadership and to deliver a focused, solutions oriented research program to address key challenges in developing long-term U.S. oil shale industry development.

Chairman, and members of the subcommittee, thank you once again for the opportunity to share my testimony with you.

HARRIS:
Thank you very much. I thank the panel for their testimony. Reminding members the committee rules limiting questions to five minutes.

The Chair will at this point open the round of questions and I recognize myself for five minutes, first.

Mr. Hagood, thank you very much for that testimony. Let me get those figures straight, there are estimates that of that 4 trillion barrels, 800 billion potentially recoverable, and if I do my math right, that's over 120 years at our current usage -- and remember that our current usage oil is actually declining over the past year. So we got potentially 120 years in that oil shale, by those numbers?

HAGOOD:
Yes.

HARRIS:
That's what I thought. And who has the largest oil shale deposits in the world? I mean, it's us -- is it some other country also?

HAGOOD:
Well, it's the United States.

HARRIS:
The United States, so let me see -- we go the -- I think I get it. OK, so -- so it's something we probably ought to be investing in.

Dr. Hill, do you realize that of the four -- oh my gosh, let me see -- $15 billion or so DOE budgets, only $5 million is spent on unconventional -- none of it, on oil shale, or shale oil and gas?

HILL:
I'm well aware...

HARRIS:
You realize that right?

HILL:
Yes.

HARRIS:
OK, because I know you mentioned the important of getting this money to graduates, but there's no money going to graduate students who are looking at oil shale from DOE I anticipate.

Mr. Martineau, let me just run that one more time, because even in the current discussion we're hearing about big oil and all of the rest of that -- the intangible drilling cost deduction depletion allowance, doesn't go to Exxon, does it? There's a vast, vast, vast majority, I mean, the vast majority goes to small owners and drillers.

MARTINEAU:

Yes, and no. Exxon, and major oil companies get to deduct 70 percent of their intangibles, and now that they've come back into this country and start drilling again that...

HARRIS:
That they continue to do it, because if they're drilling here, not over -- not making money overseas.

MARTINEAU:
(inaudible) over five years.

HARRIS:
So when we talking about that, that's about domestic manufacturing. That's a -- that brings a -- that's what I thought, and I thought -- I thought we all support domestic manufacturing.

You mentioned that it -- it's interesting because you kind of mention the importance of investing in -- in these technologies, and there are two ways you can invest with the government -- the government could invest in order to find ways to condemn the technologies, or they could find -- invest in -- to find ways to further develop new technologies.

And my fear is that some of the investment being done over at EPA and I'm -- I'm gonna get to Dr. Cugini next about DOE, maybe the former. So what we want to do is we want to kinda do research to condemn current technologies, not realizing that the future is to find the next technological breakthrough.

And it would seem to me that, that -- and I'm gonna ask you to share that opinion it seems to me that's the best we should be spending our money is actually to find out how to increase production through new technology, not finding problems with current production in order to just condemn it.

I mean, that -- that has no use if you're not gonna also find ways to improve it.

Is that correct?

MARTINEAU:
I think you -- I think you can improve the technologies that we currently have, in other words...

HARRIS:
And that would do both things at once, right, it would increase production and help the environment.

MARTINEAU:
Exactly.

HARRIS:
Right, and -- and that's -- that's the -- I'm still trying to figure out how drilling those wells a Pavilion by EPA does the latter and not the former. I'm still trying to figure it out, it's just to condemn current technology. It's incredible to me.

Dr. Cugini, let me end up -- end up with you in my last couple minutes, because you know this is about getting money into the Department of Energy to do some things.

Is that really true that there is no money spent right now on oil shale R&D? I mean, that -- that was the testimony for this committee this year.

CUGINI:
Well, I think there's been some historical funds...

HARRIS:
Not historical, this year, this year.

CUGINI:

... but those projects -- those projects are still underway. So at University of Utah we have some small amount of work going on and...

HARRIS:
And how much is small amount? Out of the $15 billion DOE budget?

CUGINI:
I -- I don't have that...

HARRIS:
Can you get that number back to me?

And I'll ask the committee to make sure we make that request to the doctor.

Because I suspect it's really small. Which is just amazing to me, because we have testimony, we have -- we have -- we're looking at 120 years of oil, and I'm not even counting the -- the things that's in shale oil and gas, we're just talking about this one resource -- 120 years. We're in the midst of a -- of -- the whole world would like to buy our oil, and we're sitting on it, and you're telling me there's one little project that Utah -- Department of Utah, and that's it for oil shale?

CUGINI:
Well, I think there's also some work that we do with Darrel Liam (ph)...

HARRIS:
Well now let me ask you...

CUGINI:
... that you pointed out during your...

HARRIS:
Let's pretend we start with a clean slate. What are the some of the things we should be doing in order to move the development of oil shale along?

What does some of the things the Department of Energy you think could do within the realm of possibility?

CUGINI:
Well obviously, several of the projects would involve improving the efficiency of the process, looking at things like better water management and those types of technologies. I think those are two key components of an oil shale program that the energy requirements and water requirements are such that it make it difficult to extract the oil economically.

So, I think a program that was addressing those two issues would allow us to look more -- further as oil shale.

HARRIS:
And do you think that Chairman Hall's bill moves us in that direction? Or it can?

CUGINI:
I think added resources would have the opportunity to do it. I think that's what I would say -- I would bring that statement.

HARRIS:
OK, thank you very much -- I -- thank you very much for answering.

I now recognize the Ranking Member, Mr. Miller for five minutes.

MILLER:

Thank you, Mr. Chairman.

I know what Emerson said about a foolish consistency, but I'm still struck by this discussion.

Dr. Cugini, you said in your testimony that -- not oil shale, but shale oil technology was a result -- that we have now, is -- was the result of research in the '70s and the '80s, federally funded (ph) research, but closely working with industry in that.

Is that correct?

CUGINI:
That's correct.

MILLER:
OK, and how -- we've heard the phrase picking winners and losers, and -- and the various technologies are in competition with each other. As -- as the coal industry has learned from the -- from the decline in natural gas prices. And I think most of the assumptions about oil -- oil shale is that the reason it's not commercially practical, although it's been researched to within an inch of its life is that -- it -- it's not commercially viable at current prices.

But, how are we not picking a winner? How were we not picking winners and losers in the '70s and '80s?

CUGINI:
Well, I think in the '70s and '80s the research was developed in -- was focused on developing technology, base sets of technology. So, you've heard testimony today about some of the work that resulted in seismic activity allow us to draw seismic maps. It was -- it was somewhat fundamental in nature.

We were also able to start to asking industry to start looking at these technologies, providing information about the resource maps and other types of information related to resources and working with industry, industry picked up a lot of the balls and -- and looking at applying, as we found out, hydraulic fracturing and other types of technology.

MILLER:
And, by the way, I support the energy research and I will support energy research into any available form of -- of energy in the '70s and the '80s, I think we were spending 10 percent of all federal research funding on energy research and I think now it's three and I -- that seems foolish to me. I think we should be spending more on energy research and it -- and it should include energy into alternative fossil fuels or unconventional fossil -- fossil fuels.

But -- so that the -- the research in the '70s and the '80s were -- were fairly early stage that might or might not work. Is that correct? Is that why the industry wasn't just doing by -- by themselves without needing government to be part of that?

CUGINI (?):
I think there were a lot of factors in play. I mean, part of it was the -- the early stages of resource -- the research. There was also a lack of information relative to whether that resource was actively there and actively extractable.

So part of the DOE's budget in research at the time was characterizing working with USGS and others to characterize the available resource. So there were a combination of interest. I -- I think one of them may have been the early stages of technology development.

MILLER:
I'm -- I'm struck by the -- the arguments -- the -- the fairly dismissive arguments about alternative energy sources as being unreliable, uncertain and the fossil fuel research that we've heard about today is described as a sure thing, a slam dunk. If that -- and Dr. and Mr. Martineau, that was your testimony. You're nodding your head now that yes, that's right.

But, it -- if it is a slam dunk, if we know it is going to be profitable, why do we need to be funding it? Why is that not an ordinary business expense for the industry that will produce it? It seems like the more logical funding should be for early stage research for technologies that might or might not prove to be commercially viable.

Dr. Cugini, I'm sorry, could you -- could you walk me through that? Could you explain that to me?

CUGINI:
Well, there -- there -- there is still somewhat risk factors associated with some of the technology, so take for example, exploiting the natural gas resource from shale -- shale development. Right now there is incentive to exploit that resource because at about 20 percent extraction of the gas which current technologies give or take (inaudible) is economically recoverable.

But there is potential to access quite a bit more of that gas through novel techniques. It really isn't any incentive in industry or capital in the industry to go after improved extraction technologies. So, that might be an example that I think addresses your questions.

MILLER:
Mr. Martineau, if -- if this research is as sure as you say it is to produce recoverable energy, why is this not -- why is our funding for this research not paying for just an ordinary business expense from the industry? Why is it not a direct just subsidies?

MARTINEAU:
A subsidy, well of course we have been an independent oil and gas operator which I've been a geologist for 52 years now and I just look back at what's happened in the shale itself.

We used to drill wells all the time through shales, noncommercial, low burn (inaudible) nanodarcy (ph) type thing and you couldn't do it. And until they started the (inaudible) shale program in 1981 when George Mitchell drilled the first well attempting to develop the gas and you think how many years it took before the shale took over. Now we have a shale revolution all over the whole United States.

But if it hadn't been for some of the research work and I'm -- and I was involved somewhat when the first horizontal well that I mentioned here before when George Mitchell drilled was funded somewhat by the Department of Energy to see if a horizontal well would -- at that time gas prices were so low it didn't make sense to do it. As the gas prices came up, we started doing it.

But some of the research that us independents could -- we don't have access to research. We strictly drill wells, drill producers dry holes and commercial wells. And so I know -- I -- I think the -- the research that's been done that I've been involved with through my years in the business has -- has been a real asset for the small independents because we don't have the research teams to come up -- the different kinds of technologies that were advanced in fracking itself. Fracking's been around for 50 years. We've been fracking wells forever.

And but the technology of hooking a horizontal well with a frack job, and they used to frack them all with water in one stage or no gel and then they switched to water, increased the production tremendously.

The horizontal legs now used to be 2,000, 3,000 feet, now they're 6 to 7,000 feet with 50 fracks in it. In other words, the technologies and the mapping that he did showing where the frack job goes is really critical because nobody knew before. The microseismic work that we've done and the technology that was backed by funded research from the Department of Energy and different people how to do -- how do you trace where these frack jobs go.

The big issues, of course, is -- is frack water contaminating the fresh waters and that mapping that he showed, it only goes 150, 200 feet away from that well bore. They go up into the fresh water zone, it doesn't happen. There's never been a well yet that has been contaminated by a frack job from -- in the fresh water zones. They've been contaminated all right, but it's because of poor casing cementing or the

lack of integrity in the pipe which has caused the water but you know, they've been -- they've been opening water wells in home forever and you can light a match to it and, you know, it's not the first time.

Since fracking came around, everybody says oh, they're caustic. That's not true. That's been happening forever in this United States.

HARRIS:
Thanks very much and the gentlemen yields back his time.

Chairman Hall is recognized for five minutes.

HALL:
Thank you, Mr. Chairman and I thank Dr. Cugini and Martineau and others (inaudible) there could also point out that independents seek and search for and then -- and majors buy it and independents are the ones that take the chance and need some help.

Years ago, I think that the names of Frank Pitts and Shelby Pitts is well known to this committee. They've been before this committee before Energy and Commerce many times and (inaudible) is a product of theirs for -- for being here.

Mr. Martineau, I want to thank you also for the impact on unconventional energy production in Texas. As -- as you know states currently have the authority to regulate hydraulic fracturing, though I'm concerned that the EPA's activists regulatory agency and disregard for scientific methods, not taking a scientific approach to it in their attempts to usurp this authority.

How does a responsible regulatory agency for oil and gas production in Texas, that's the Railroad Commission, perform regulation and oversight of TIPROA members and their companies?

MARTINEAU:
Well the Texas Railroad Commission has been overseeing the development of oil and gas for many, many years. And they've got technical staff of engineers and geologists just like the oil companies do and whenever a frack job is performed, of course, now with the new frack focus, you have to report exactly what has been pumped into the particular well.

And that information was somewhat -- somewhat started kind of by the Railroad Commission saying because everybody kept saying well we don't know what's going into the well and but the Railroad Commission oversees all the development when you're drilling a well, how much surface casing you have to set to protect the fresh waters and how much cement you actually have and you have to report all this information to the Railroad Commission.

So they've been overseeing the operations of oil and gas in Texas forever and to have the EPA come in and I testified -- well I didn't testify, I went over to a hearing where the EPA was talking about, you know, trying to control fracking and every state -- every rock is a little bit different. You frack them all different. You can't come up with one rule that covers the entire United States.

Each state has different types of rock and therefore, each state has its own regulatory agency and therefore, you don't need to have one massive rule by people who have never drilled a well in their life trying to tell you how to do it.

HALL:
Well, Mr. Miller asked some questions -- logical questions about why can't the success pay for the search, you know. It's probably true that -- that the independents do take all the chances and the majors buy them after they're successful. That's the reason that they need some support in -- as -- as they go.

And before I yield back my time, I want to thank Mr. Miller for his service to this committee. He's been very valuable member. He goes back to my state. All my people came from North Carolina, give his services there and I want to wish him well there.

I yield back my time.

HARRIS:
Thank you very much, Mr. Chairman.

And the gentleman from California, Mr. McNerney's recognized for five minutes.

MCNERNEY:
Thank you Mr. Chairman and I thank the panelist for -- for coming today and testifying.

Most of my colleagues, I believe would be in favor of providing research dollars for the development of -- of energy resources but I just challenge my Republican colleagues to be as receptive toward spending dollars on clean energy as they are on fossil fuel energy.

For example, the wind industry production tax credit is about to expire this year, that'll throw about 40,000 out of work and this is an industry that's been developed in this country by American research dollars. These jobs are going to go overseas and they're going to be taken over -- this industry's going to be taken over by our competitors.

So I think it's important that we keep that in mind as we move forward. Now I think everyone on this panel agrees that the unconventional resources are massive -- there's a massive amount of energy and fossil fuels there.

But what is the energy balance of the unconventional resources versus the conventional resources, pick any one of them, tar sands or -- or shale oil, what's the energy out versus the energy in compared to what it looked like when oil was first being developed back in -- in the 1900s?

Does anyone what to take a shot?

Dr. Hill, do you want a stab at that?

HILL:
All right.

The -- well certainly some energy is -- is expended in creating these wells and -- and you could pretty much figure it out from the economics, you know, compare the -- the value of the oil produced compared with the cost to create and complete the wells. And a typical good oil producing well now from a shale formation, you know, that -- that ratio might be two or three to one. In other words, two or three times the -- the value the crude oil produces two or three times the cost of the well. So that's -- that's a rough ratio.

MCNERNEY:
Well, I mean that sounds about right. Back in -- in the (inaudible) oil well days, they -- they were talking about 90 or so a month. So we're seeing a much bigger investment of energy into these wells than we ever saw before. And those of us that are concerned about CO2, and global warming, and I'm one of those people, we're going to be putting two or three times as much carbon into the atmosphere per unit of energy delivered. So this is a very big concern for myself, for a lot of people across this country about what impact it's going to have on our global environment. And I think that's something that we need to consider as we move forward, and the research dollars that are spent in this program, to understand that impact and to find ways to mitigate that impact if carbon sequestration is part of the solution.

Now another question I have is, will the so-called energy dependence that we're aiming at, result in any lower costs for American consumers as opposed to the cost that it -- it will reduce for foreign consumers? So, what I'm getting at is, yeah this is going to produce a lot more energy, a lot more oil, but this is fungible. This is an international market. Those products are going to go overseas just like they are to this country. It's not going to help our consumers any more than it's going to help our consumers any more than it's going to help any other consumer in the world.

So to say that this is benefiting American consumers more than foreign consumers, I think is not necessarily true. It's not necessarily a true statement. Does anyone care to respond? Mr. Martineau? We got -- go ahead?

MARTINEAU:
You know I -- I -- you know one thing earlier that you said about the other resources, and I think of biofuels in particular. Because it's kind of interesting, you hear a lot of conversation, you know biofuels are what, 10 percent of the gasoline you have to do now? And the cost of the biofuels, which is this third party energy, green energy type thing, comes from the corn that's grown. And then we're talking about how much water it takes to keep that corn growing, which is the water that -- we're now talking about how do we use it, we're using up all of the water in fracking.

A lot of it's being used to grow the corn. The corn now goes into biofuels, and doesn't go to the food, and so our food prices have gone up. And so, you know these are the third party type green energy things that I think that are very expensive, that people don't put the real dollar to.

(CROSSTALK)

MARTINEAU:
With that 10 percent cost, it's unbelievable, you know...

(CROSSTALK)

MCNERNEY:
I -- I agree there needs to be a fair look at all these sources. And I'm not going to single out fossil fuels because corn-based ethanol has its -- has its problems, no question about it. The last question I have is regarding -- to the industry's record for hiring veterans of this country? The wind industry has the best record of any industry of hiring veterans because of the transfer of skills. What's the record of the fossil fuel industry in this -- in this area?

MARTINEAU:
I'm not real sure, although I heard, and I'm not sure which group, they're doing a program in -- in -- I think it's in Houston, I'll have -- I'll have to find out, where they're bringing in all of the veterans because the job increases -- that have increased in the United States recently because of the -- the shale revolution is unbelievable. And we're -- they're putting a program together, and I can find out the name of it, but it is to ask veterans to come in, study how to be a roughneck, how to be a roustabout, you know? Either that or, can they go to college and become an engineer, or a geologist?

So there are programs that are using veterans, and especially them because we can't find people to go to work in all of these shale plates that are going on right now. And I think your group in the wind industry, they can go to work in the oil industry. They don't -- they're not going to have to go overseas. They can go to work in the oil and gas...

(CROSSTALK)

MCNERNEY:
Mr. Chairman I'd ask that you consider that a part of your bill, Mr. Hall? To give provisions -- special provisions for training and hiring veterans if they're going to be used in this research?

(CROSSTALK)

HARRIS:
Thank you very much Mr. McNerney, and I know recognize the gentleman from California, Mr. Rohrabacher for five minutes?

ROHRABACHER:

Well, let me just note that, I mean people are -- in this country are forced to use energy resources that are more expensive than the alternatives that they could use otherwise because of some hairbrained environmental theory that -- whatever that hairbrained theory is, that that expense, or that -- which is usually hidden from the public, goes right out of the pool of money that we have to provide good jobs for our veterans, and everybody else.

So wind costs five times as much to produce the same amount of electricity as natural gas. That's how much money less we have to provide good jobs for veterans, and anybody else in this country, because we're eating up something that could be -- resources that could be used -- put to better use and are now just evaporated because that wealth no longer exists. I find wind to be one of the -- and from what I have seen just from -- and heard from various sources, is one of the most inefficient ways of producing electricity per cost, that we -- and not to mention the fact that there are environmental costs to it as well to the thousands of birds that get killed.

Now I'm not necessarily a bird man here, but I can just tell you that there are many more birds that are killed by windmills than they are by fracking, from what I understand. And by the way, wind energy is not anything new. My family came from a small farm in North Dakota, and I used to go up there and work on the farm in the summertime, sometimes the wintertime. They had windmills back then in fact -- in fact about 100 years ago, windmills were thought to be the potential use for electricity and -- especially on farms and places like that.

But, they decided not to go in that direction because it was cheaper, and it was a waste of resources not to go with the cheaper method of producing electricity. And if you don't go with the cheaper method, you're evaporating wealth, which could be put to use in improving people's standard of living. I do have -- I, however -- let me -- and let us also note, the idea that we have not been financing quote "green energy research", as compared to what we're doing with -- with oil and gas is just incredible.

I mean we have -- it's -- hundreds of times more money has been spent on green energy research, than in oil and gas. And that's -- that's documented here. However -- and one other thing, I think the oil industry and the gas industry, one of the most vilified industries that have done so much good for our country. Having come from a family in North Dakota, I realize what our cities must have smelled like when we were relying on horses for our transportation system. And I will tell you that 100 years ago one of the biggest problems was horse manure, and -- and the smell, and the stench, and the health related things. And the oil industry saved us from all of that.

And kids aren't even taught that now. They just think that it was hunky-dory back in those days. But one thing that I probably would disagree with the industry about is -- is about this whole research thing that we're talking about today. If -- if we are putting money into research, which is what we're talking about, and we're talking about how fracking became a -- you know a viable source, and there are certain technologies that were developed, and certain government involvement in that, what's the American taxpayer getting out of that?

Are we going to -- as far as I'm concerned, if we invest in -- if we invest in the development and technology for your industry, and that technology reaps a big reward because after producing all this energy now, and making billions of dollars doing it, shouldn't the taxpayers be the owners of that technology if it's -- if we're investing in it? And how much have we gotten back from our investment in research, for example in fracking and other things. Besides the fact the public is benefiting, there's no doubt about that.

But, we're talking about any other industry and people who put money into research and development, develop new technologies, they have the patent, the rights, and they have the property rights to that utilization. They make money on it. Shouldn't the taxpayers make money if they're -- if we're investing in developing your technology? Anybody can answer that, that's fine with me? Somebody want to -- go ahead?

(UNKNOWN)
I -- I guess the government could do that if they chose to. In other words if the Department of Energy

funded research, that the Department of Energy could own the, you know intellectual property. In general the way it's always been is that this type of research is done for the general benefit of -- of the public...

ROHRABACHER:
Right.

(UNKNOWN)
... and the land, and so that -- that knowledge that's created is shared with everyone.

ROHRABACHER:
Mr. Chairman, just for the record and -- and this hearing, that this is one Congressman that would insist that if we're going to invest taxpayer money in, whether it's the oil industry, or any other industry, that -- developing technology for them to make a profit, the taxpayer should have an ownership right of some kind on the technology that's being developed. And that is just for the record. Thank you very MUCH.

HARRIS:
Well, thank you, I want to thank the gentleman from California...

(CROSSTALK)

MARTINEAU (?):
... add to one thing there? If you think about the economy, the natural gas prices here in the United States, they are benefiting because we have so much natural gas now, that gas price is down so low, and they are benefiting indirectly. If not, they want to move to Europe? They sure can, and pay $11 an MCF over there, as opposed to $3...

(CROSSTALK)

ROHRABACHER:
You know any time you do something right in a -- in a free market economy, it means somebody's going to make some more money, right? So it's not just you're -- off oil and gas, it's anybody -- if we were -- if we were paying the research and development costs for any other industry, and then they were profiting from it, that would be different if that industry was using their own money and developing their own technology, they would -- they would actually own the rights to that particular technology. And they would lease it out to other people, and make money from it.

Now if the United States government is going to do this for your industry, or any other industry I might add, I just think that the taxpayers should own that -- that share of the technology that they're helping to develop, and the go into the coffers of the taxpayer.

HARRIS:
Well, again, I want to thank the gentleman from California. And the gentleman -- the new gentleman on the committee has been very patient waiting, I -- it is my pleasure to recognize Mr. Curson for five minutes for questioning?

CURSON:
Thank you, and being the newest member, and probably the least knowledgeable about this issue, but I have studied the history of this committee, and these hearings, and first I want to agree with the previous speaker that I'm glad our automobiles aren't powered by horse manure coming from the -- from the industry. But it is a renewable source, let me note.

(LAUGHTER)

But in -- in -- in this particular issue, I know the question that the citizens of my district will ask is, we've got an industry that the government has participated in R&D. This is a for-profit industry. They provide the oil industry very generous tax breaks and incentives. The three largest companies -- oil companies in America in 2011 made $80 billion in profits, while the rest of the economy was struggling out of the worst

recession that we've had in many, many years. Why would the government pay for R&D to create more profit for a profit company, when these companies aren't making nickels and dimes, they're making huge dollars?

I heard clearly that many of the smaller oil companies that don't make these types of profits are the ones that are the actual benefactors. Well, there's other ways for those companies to take advantage of -- of this rate. I believe that -- I would like to have an answer on why -- in the big picture with companies making this kind of profit, should the government be rolling out taxpayer dollars to do your R&D. Particularly -- these aren't new technologies, these, unconventional resources have been around for years, and the oil companies have decided not to pursue them because they weren't profitable in the end.

So if now new technologies are making it more clear that they can be profitable, you would think that would be the responsibility of the oil companies to pursue it. And -- and right in previous hearings on this very subject, when -- when you get a member of the U.S. Chamber that quote, says "I don't think you will find anybody in the industry that is saying, we need more money from the federal government." I believe that's the same thing that citizens in my district would -- would say.

So if there's a -- a reasonable answer to that I'd like to hear that?

(UNKNOWN)
I would like to point out that, again as I said in my testimony that the majority of research funding of this type that goes to the Department of Energy, in general is funding the university research. It's not going to Exxon-Mobile. It's not going to the very profitable oil companies. It's being spent in universities, and this is how we are able to train the engineers that this country desperately needs. And so I'd really like to encourage you to think of that way.

Don't think of this is as -- not money flowing directly to the industry. It is helping develop technology that anyone in the country is welcome to use. But it's really being spent in support of education.

MARTINEAU (?):
And -- and that education goes to people like Apple. You notice where Apple is on their profits compared to Exxon? You need to look at that. It's four times higher than what Exxon is. And the engineering that he was just talking about from those students, is what helped. Will you give up your phone? Will you give up your computer? Will you give up the plastic that you use every day in these water bottles? It all comes from the research done originally by the oil and gas industry, and utilized by other technologies like Apple.

(UNKNOWN)
Will the gentleman yield?

CURSON:
I yield the rest of my time.

(UNKNOWN)
What percentage of the little independents that drill and hit, to those who drill and miss?

MARTINEAU (?):
You don't want to know the number of dry holes I've drilled in my life.

(LAUGHTER)

(UNKNOWN)
I think that answered my question.

(LAUGHTER)

MARTINEAU (?):
Yeah, and you know and it -- it kind of goes back to -- speaking of dry holes made me think about when

we're talking about intangible drilling deductions. And the reason that bill was put in place back in 1913, was because at that time if you drilled a bunch of dry holes or noncommercial wells, you were out of business. And if you didn't continue having some sort of resources -- so that tax bill for intangible drilling was passed in 1913, 100 years ago. And because of that being able to continue if you drill dry holes and noncommercial wells they're called, is what's kept our industry alive.

And to be able to say you want to take away intangible drilling costs, you'll put so many companies out of business it's unbelievable. Because not everybody drills a producer, let me tell you. It can be noncommercial wells, and people forget about those, but you haven't got your money back. And it's not like making a washing machine, or an automobile, it comes out every day.

HARRIS:
Thank you very much. And I want to thank all of the witnesses for your valuable testimony, and to the members for their questions. The members of the subcommittee may have additional questions for the witnesses, and we ask that you respond to those in writing.

(CROSSTALK)

HARRIS:
I'm sorry, yes? The gentleman from California?

ROHRABACHER:
I'd like unanimous consent for one minute.

HARRIS:
Without objection.

ROHRABACHER:
I'd just like to thank Mr. Miller for the job that he's done with us. It's been -- it's been a lot of fun convincing me on various issues, and he's a very intelligent member, and a very hardworking member of this committee, and sometimes we've had disagreements obviously, but the fact is, is that he's a very respected person here, and we'll miss him, and wish him well in -- in the years ahead. Thank you for the good job that you've done.

MILLER:
Thank you Mr. Rohrabacher. I'm not aware of any instance in which any one of us has convinced the other of anything...

(LAUGHTER)

But thank you.

(LAUGHTER)

HARRIS:
I thank -- I want to thank the gentleman from California and echo the gentleman's comments. It's been a pleasure working with the ranking member, and you know in the end, we all realize that we want what's best for the country, and what's best for Americans, and do our little bit here on the Energy Environment Subcommittee, the Science Committee towards that end. And I want to thank him for his service to the Congress and to his district.

Anyway, we'll ask you again to respond to any questions in writing that come from committee members. The record will remain open for two weeks for additional comments from members. The witnesses are excused. And the hearing is adjourned.

CQ Transcriptions, Nov. 30, 2012
List of Panel Members and Witnesses

PANEL MEMBERS:
REP. ANDY HARRIS, R-MD. CHAIRMAN

REP. DANA ROHRABACHER, R-CALIF.

REP. ROSCOE G. BARTLETT, R-MD.

REP. FRANK D. LUCAS, R-OKLA.

REP. JUDY BIGGERT, R-ILL.

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WITNESSES:
ANTHONY CUGINI, DIRECTOR, NATIONAL ENERGY TECHNOLOGY LABORATORY, U.S. DEPARTMENT OF ENERGY

DAVID MARTINEAU, CHAIRMAN, TEXAS INDEPENDENT PRODUCERS AND ROYALTY OWNERS ASSOCIATION

DANIEL HILL, INTERIM DEPARTMENT HEAD, PROFESSOR AND HOLDER OF THE NOBLE CHAIR IN PETROLEUM ENGINEERING, TEXAS A&M UNIVERSITY

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Hide table of contents

COMMITTEE TESTIMONY
Nov. 30, 2012
Table of Contents

CQ Abstract
Anthony V. Cugini, director, U.S. Department of Energy
Michael C. Hagood, director, Idaho National Laboratory
Rep. Ralph Hall, R-Texas
Rep. Andy Harris, R-Md., subcommittee chairman, opening statement
Dan Hill, Head professor & Noble chair, Texas A&M University
David Martineau, chairman, Texas Independent Producers and Royalty Owners Association

U.S. Energy and R&D

CQ ABSTRACT
SCHEDULED WITNESSES
TESTIMONY
Committee Holding Hearing:
House Science, Space and Technology Committee — Subcommittee on Energy and Environment
CQ Abstract:
Energy and Environment Subcommittee (Chairman Harris, R-Md.) of House Science, Space and Technology Committee will hold a hearing on expanding U.S. energy via research and development.
Scheduled Witnesses:
Anthony Cugini, director, National Energy Technology Laboratory, Department of Energy; David Martineau, chairman, Texas Independent Producers and Royalty Owners Association; Daniel Hill, interim department head and professor of petroleum engineering, Texas A&M University; Michael Hagood, director, Energy and Environment Science and Technology Program Development, Idaho National Laboratory

Testimony:
Statement of Anthony V. Cugini, Director, National Energy Technology Laboratory, U. S. Department of Energy
Committee on House Science, Space and Technology Subcommittee on Energy and Environment
November 30, 2012
Chairman Harris, Ranking Member Miller, and members of the Subcommittee, I appreciate the opportunity to discuss the role that the Department of Energy`s Office of Fossil Energy`s National Energy Technology Laboratory continues to play in the safe and responsible development of the Nation`s unconventional oil and natural gas resources.
As you know, since 2008, U.S. oil and natural gas production has increased each year. In 2011, U.S. crude oil production reached its highest level in nearly a decade. Natural gas production grew in 2011 as well - the largest year-over-year volumetric increase in history. Overall, oil imports have been falling since 2005, and our dependence on imported oil declined from 57 percent in 2008 to 45 percent in 2011 - the lowest level since 1995.
One of the factors enabling us to make such progress is that our country enjoys a bounty of oil and natural gas resources. Over the past century, Americans have applied their ingenuity towards extracting these resources, which in turn have helped to fuel our Nation`s economic prosperity.
Domestic Unconventional Oil and Natural Gas Resources
There are a number of unconventional resources with the potential to support the president`s all-of-the-above energy strategy and to help reduce U.S. reliance on foreign oil. These include U.S. oil reservoirs amenable to carbon dioxide enhanced oil recovery (CO2 EOR), heavy oil, oil shale, shale oil, and natural gas resources including methane hydrates.
Studies have shown that 24 billion barrels of residual oil may be economically recoverable1 with the application of current CO2-EOR technologies and another 36 billion barrels with widespread application of ``next generation`` CO2 EOR technology2. For perspective, the U.S. currently uses about 5.4 billion barrels of crude oil per year and has proved reserves of about 23 billion barrels3. In addition to the post-waterflood residual oil left behind in producing oil reservoirs, there are significant amounts of oil in

``residual oil zones`` or ROZs, the portion of an oil reservoir below its estimated oil-water contact. These zones can extend for hundreds of feet and could hold large volumes of previously undocumented oil amenable to recovery via CO2 EOR. The National Coal Council estimates that 33 billion barrels of ROZ oil is recoverable at a crude oil price of $85 per barrel

In addition to the residual oil and ROZs, oil shale, heavy oil, oil sands and shale oil (conventional oil in shale formations) offer a huge potential in the US. Taken together, these four unconventional oil resources total more than 3000 billion barrels of liquid hydrocarbons in place5. Even if one were to assume that only 10 percent of this oil could be recovered economically, it would mean a significant increase in the Nation`s domestic energy supply.

The United States is equally well-endowed with unconventional natural gas resources. Production of natural gas from unconventional rocks, tight sands, coal seams, and organic shales, has risen sharply during the past two decades. Production of natural gas from shale source rock in 2012 in the U.S. is roughly 25 times what it was in 20006. This rapid growth in shale gas production is recognized to be the result of the combined application of horizontal drilling and large-volume hydraulic fracturing technologies. EIA`s 2012 Annual Energy Outlook estimates that 482 trillion cubic feet (Tcf) of unproven but technically recoverable natural gas exists in eleven major shale gas plays, more than 1.75 times the current total for U.S. dry gas proved reserves and more than 20 times the 2011 annual marketed dry natural gas production (23 Tcf).

Even more abundant than shale gas is natural gas from methane hydrate. In 2008, the U.S. Bureau of Ocean Energy Management, Regulation and Enforcement, released a preliminary assessment of the in-place gas hydrate resource in the Gulf of Mexico. The assessment, which does not consider whether the resource is technically or economically recoverable, estimated a mean value of 21,400 Tcf of methane-in-place in hydrate form. The assessment also determined that about 6,700 Tcf of this resource occurs in relatively high concentration accumulations within sandy sediments; the sort of reservoirs that would be more likely to permit gas flow. To put these enormous methane hydrate resources in perspective, the DOE EIA reports that the US consumed a little more than 24 Tcf of gas in 2011.

Also in 2008, the United States Geological Survey estimated that there is approximately 85 Tcf of undiscovered, technically recoverable natural gas resource within gas hydrates on the North Slope of Alaska. If methane hydrates can be proven to be technically and economically producible, this onshore resource located near existing oil and gas production infrastructure is likely to be the first methane hydrate deposit to be tapped.

Current Status of Research and Technical Challenges

Unconventional resources are much larger in volume than are our conventional resource stores. These resources, however, generally exist in more geologically complex settings or in more remote or environmentally sensitive areas and require more intensive production methods. The safe and responsible development of unconventional domestic fossil resources creates jobs and provides economic benefits.

Federal coordination and collaboration is critical to successfully addressing the environmental and safety challenges associated with unconventional oil and gas development so that the benefits highlighted above can be realized. To this end, the President signed an Executive Order on April 13, 2012, creating a new Interagency Working Group to Support Safe and Responsible Development of Unconventional Domestic Natural Gas Resources. On the same day DOE, the Environmental Protection Agency, and the Department of the Interior`s U.S. Geological Survey signed a related Memorandum of Agreement initiating a Multi-Agency Collaboration on Unconventional Oil and Gas Research.

The objective of this collaborative effort is to better understand and address the potential environmental, health, and safety impacts of shale gas activities, although the research is also applicable to the development of other unconventional oil and gas resources. Through the collaboration, a robust Federal R&D plan will be developed, taking into account high priority recommendations of the Secretary of Energy Advisory Board (SEAB) Natural Gas Subcommittee. DOE`s role in this initiative will focus on priorities identified by the interagency collaboration in a research plan to be formed within its area of core research competencies.

The Department is carrying out research directed at quantifying and understanding the environmental and safety risks of shale gas and shale oil development, as well improving our understanding of emerging and developing shale plays, lowering the cost and increasing the efficiency of technologies for treating hydraulic fracturing flowback water, and optimizing the recovery of shale gas resource. These efforts are funded through Title IX, Subtitle J, Section 999 of the Energy Policy Act of 2005, the Ultra- Deepwater and Unconventional Natural Gas and Other Petroleum Resources Program.

DOE`s current CO2 EOR research portfolio is focused on developing and demonstrating next generation technologies designed to accelerate the application of CO2 EOR in those basins where it has not yet been applied, and in those reservoirs within areas with existing CO2 EOR that have not been viewed as economic candidates.

While technology exists for producing heavy oil, there are challenges that still require research, although given the economic benefits from producing efficiently, industry has incentive to do most of this research themselves. A key challenge is mitigating the environmental and safety risks inherent with heavy oil and oil sands development. Recent DOE efforts have been focused on heavy oil deposits in the Ugnu Formation on the North Slope; understanding the formation`s geological complexity; and developing water soluble polymers suitable for waterflooding Ugnu heavy oil reservoirs.

Oil shale was a major topic of public and private research in the 1980s, but interest declined when other less expensive sources of oil became available. In 2007 and 2009 the Bureau of Land Management (BLM) leased Federal minerals in Colorado and Utah to private companies to permit them to conduct oil shale research projects, with the possibility that the projects could be followed by a commercial leasing program. At least seven companies are utilizing these leases or other privately held oil shale properties to test both surface retorting of mined shale and in situ retorting technologies. A key research challenge associated with oil shale is the need to develop and evaluate technologies for reducing or controlling the potential for surface and subsurface water contamination and other environmental impacts. With regard to methane hydrates, the DOE has successfully finished a pilot production well. Because of this effort and past DOE efforts, hydrates have moved from a scientific curiosity in 2000 to a known resource today.

DOE Capabilities and Expertise

The DOE`s Office of Fossil Energy (FE) with support by the National Energy Technology Laboratory (NETL) remains well- positioned to address appropriate research challenges related to environmental sustainability and safe development of these unconventional oil and natural gas resources. FE and NETL have a long history of successfully engaging industry and academia, forming collaborative partnerships that leverage individual strengths to achieve useful results. FE and NETL engage with a wide array of experts when formulating research plans, including Federal Advisory Committees, industry experts, members of NETL`s academic research consortium, authorities at other National Laboratories, and on-site scientists and engineers.

NETL`s 1970- and 1980-era contributions to the fundamental research that resulted in the current shale gas ``revolution`` have been reported in the press, but three examples of DOE research highlight recent contributions made by DOE.

First, as mentioned above, the Ignik Sikumi well on the North Slope of Alaska represents an unprecedented test of technology to safely extract a steady flow of natural gas from methane hydrates. DOE partnered with ConocoPhillips and the Japan Oil, Gas and Metals National Corporation to conduct a test of natural gas extraction from methane hydrate using a unique production technology, developed through laboratory collaboration between the University of Bergen, Norway, and ConocoPhillips. Between February 15 and April 10, 2012, the team injected a mixture of CO2 and nitrogen into a hydrate bearing zone and demonstrated that this mixture could promote the production of natural gas. This test was the first-ever field trial of a methane hydrate production methodology whereby CO2 was exchanged in situ with the methane molecules within a methane hydrate structure, and the 30 day-long production test was five times as long as any previous test.

Second, in 2010 DOE partnered with Altela Inc. to test the AltelaRain fracturing water treatment process at a well site in western Pennsylvania. Over a 9-month period, 77 percent of the produced hydraulic wastewater was successfully treated onsite, resulting in distilled water as the effluent. Following the DOE-sponsored demonstration project, four AltelaRain modules were sold and installed at a facility in Williamsport, Pennsylvania, for treating Marcellus shale wastewater. Building on the success of this application, in 2012 Altela Inc. and its partners are opening two new wastewater treatment facilities in western Pennsylvania. Each facility is able to process up to 12,000 barrels of wastewater a day about 500,000 gallons per facility. The purified water can then be reused for any number of purposes.

Third, DOE is currently collaborating with Petroleum Recovery Research Center at New Mexico Tech to develop a nanoparticle- stabilized CO2 foam system that can improve the sweep efficiency of injected CO2 in EOR projects. The research team has demonstrated for the first time that adding a small amount (30-50 parts per million) of surfactant to a silica nanoparticle solution significantly improves CO2 foam generation and foam stability. Using nanosilica particle stabilized CO2 foam rather than a straight CO2 and water mixture, the researchers were able to recover up to 80 percent of the residual oil that remains after waterflooding. DOE and New Mexico Tech are continuing to quantify the performance of these

foams in core flooding experiments under a variety of conditions and concentrations, but it is clear that cutting edge technologies utilizing next- generation materials like nanoparticles can dramatically improve oil recovery.
These three examples illustrate the range of approaches international collaboration, field tests on new technologies with industry partners, laboratory experiments with academic researchers that are reflected in DOE`s unconventional oil and natural extramural gas research program.
Conclusion
The U.S. contains significant hydrocarbon wealth that can be extracted and used to provide economic benefits for all Americans. Developing our unconventional oil and natural gas resources in an environmentally sustainable and safe manner will require new technologies. DOE has demonstrated its ability to engage industry and academia to perform research that can help catalyze the development and application of these new technologies.
The research challenges are significant. Producing unconventional oil and natural gas requires that industry expend more energy, use more water, contact larger portions of the reservoir, and counteract more physical forces than when producing conventional oil and natural gas resources. It is important that we understand and minimize the unwanted consequences of unconventional fossil resource development. But as they have in the past, new technologies can provide ways to reduce or eliminate these barriers.
The Department of Energy is committed to developing, where appropriate, the science and technology that will allow the Nation to use its abundant fossil energy resources in a way that balances the energy needs for sustaining a robust economy with continued environmental responsibility. As we move forward on a multi-agency, collaborative research program with DOI and EPA, the Office of Fossil Energy will pursue its mission with the same commitment to excellence and innovation.
Mr. Chairman, this completes my prepared statement. I look forward to addressing any questions that you or other members of the Subcommittee may have. Thank you.

Michael C. Hagood, director, Idaho National Laboratory
Committee: **House Science, Space and Technology Committee -- Subcommittee on Energy and Environment**
Subject: U.S. Energy and R&D
Testimony:
Statement of Michael C. Hagood, Director, Program Development Energy and Environment Science and Technology, Idaho National Laboratory, Idaho Falls, Idaho
Committee on House Science, Space and Technology Subcommittee on Energy and Environment
November 30, 2012
INTRODUCTION
Chairman Harris, Ranking Member Miller and members of the subcommittee, thank you for the opportunity to testify before the House Science, Space and Technology Subcommittee on Energy and Environment. Addressing United States (U.S.) energy security is extremely important and establishing an U.S. oil shale research and development (R&D) program is strategic, in my view, to securing our energy future.
My name is Michael Hagood. I am the Program Director for Energy and Environment Science and Technology at Idaho National Laboratory. I am a geologist by training and have worked in the energy and environment sectors for over 30 years.
My testimony will address the following:
-- Background on Western U.S. oil shale resources; -- How safe and responsible production of oil shale contributes to U.S. security goals; -- Identification of selected technical challenges and R&D needs; -- Comments on strategy to identify and prioritize R&D; -- Comments on draft legislation titled ``Tapping America`s Energy Potential through Research and Development Act of 2012.``
OIL SHALE RESOURCE BACKGROUND
The United States is currently experiencing an increase in domestic oil and gas production, primarily associated with its shale gas and tight light oil (shale oil) resources. Production from U.S. oil shale resources, as well, will likely emerge during the next several years as an important contributor to oil and gas production with the potential to ramp up into a substantial industry during the next few decades and lasting for most, if not all, of this century.
Oil shale is a fine-grained sedimentary source rock, containing organic matter called kerogen, an algae or

marine based material that has not yet been converted into oil. When heated using a pyrolysis (retort) process, oil shale can be converted to either crude oil or gas. Crude shale oil is then processed in an oil refinery to produce gasoline, diesel and jet fuels.

Oil shale resources in the United States are immense in size, with most of the resource located in the states of Wyoming, Utah and Colorado. The richest oil shale was deposited in the north- central part of the Piceance Basin in Colorado and in the northeast corner of the Uinta Basin, located in parts of northeast Utah and northwest Colorado (Mercier and Johnson 2012). The Colorado deposits extend from approximately 1,000 feet to as much as 3,000 feet beneath the surface. Within the oil shale column are geologic formations that vary considerably in kerogen content and oil concentration. According to U.S. Energy Information Administration (EIA), the entire column ultimately could produce more than one million barrels oil equivalent per acre during its productive life, compared to Canada`s oil sands deposits which are expected to produce about 100,000 barrels per acre (EIA 2009).

Estimates from recent U.S. Geological Survey studies indicate that between Colorado, Utah and Wyoming, nearly four trillion barrels of oil are estimated to be in place. Most of this resource is located on federal lands. Of the estimated four trillion barrels, it is not known how much oil is potentially recoverable and depends on technical and economic conditions. However, the Rand Corporation (Bartis et al., 2004) estimates that 30 to 60 percent of the oil shale may be recoverable. This is most significant, given that U.S. usage is approximately 6.8 billion barrels in 2011 (18.83 million barrels per day) and projected to be 7.3 billion barrels/yr. in 2035 (19.9 million barrels per day) (EIA 2012).

Oil shale development occurs by either in situ (in place) retorting or ex situ (at the surface) retorting. During the mid- 1970s and early 1980s, the petroleum industry focused its efforts primarily on underground mining and surface retorting of oil shale. Today, mining and surface retorting is planned in areas where oil shale is located nearer the surface and more economical to mine. However, the higher concentrations of oil shale resources are located at depths where in situ processes may be more cost effective.

It is more likely that mining with ex situ retort operations will be initiated first by the U.S. oil shale industry and which will be primarily conducted on state and/or private lands. In situ retort operations within the richer formations will likely be initiated later. EIA estimates that the earliest date for initiating construction of a commercial project is 2017 for ex situ process and 2023 probably is the earliest initial date for first commercial production of in situ processes (EIA 2009). However, the Red Leaf Resources Eco Shale process, which is a modified surface retort method, may come on line as early as 2015.

Establishing an oil shale industry is heavily dependent upon economics and the price of a barrel of oil. According to industry representatives (represented by the National Oil Shale Association), it costs somewhere between $40 and $80 to produce a barrel of oil from shale, depending on the technology used. The price of oil, currently at ~$87 a barrel, has risen in the past over $100 a barrel.

HOW DOES SAFE AND RESPONSIBLE PRODUCTION OF OIL SHALE CONTRIBUTE TO U.S. SECURITY GOALS

A viable oil shale industry would help meet U.S. energy demands and reduce dependence on selected imports and associated costs, as well as reduce the risks associated with potential supply disruptions. New jobs directly related to oil and gas industry and the domestic production supply chain would arise from this industry, including those potentially associated with value-added industries, not yet identified. Development of an oil shale industry will also result in increases in tax and royalty payments to federal and state government for oil production on their lands and contribute to the U.S. gross domestic product (Unconventional Fuels Task Force 2004, 2006; GAO 2012).

Currently, it is not known what production rates may be achieved by an oil shale industry, however DOE provided a vision of a commercial oil shale projects that would range in size from 10,000 to 50,000 barrels per day for surface retorts to as much as 300,000 barrels per day for full-scale in situ projects. For the DOE study, a reasonable development scenario envisioned cumulative production of two to four million barrels per day by 2020 to 2030. The time to market, however, depends on the level of R&D support and other factors.

SELECTED TECHNICAL CHALLENGES AND ASSOCIATED RESEARCH AND DEVELOPMENT NEEDS PERTINENT TO CREATING AND SUSTAINING A U.S. OIL SHALE INDUSTRY

While an U.S. oil shale industry will likely be initiated on a small portion of the U.S. oil shale reserves using current technologies, an aggressive R&D program is required to help tap the largest and most valuable portions of the U.S. reserves. Specifically, R&D is required for in situ processes to explore and advance new approaches and innovative concepts. More research promises to expand technology options, improve operability and efficiency, mitigate potential environmental impacts and reduce costs of

producing oil shale (DOE, 2004). Advancement of novel concepts and new approaches requires significant investment in long-term, high-risk R&D to reach proof-of-concept stages of development. Similarly, applied R&D is needed to develop and prove technology at bench or field scale prior to demonstration at a commercial scale (DOE, 2004).

Research and Development has already played a strategic role in the successful development of unconventional fossil energy resources, such the Canadian oil sands, U.S. shale gas and shale oil (light tight oil, e.g., Bakken Formation). All of these R&D programs took many years to bring new products to market. Relative to oil shale, a summary profile of oil shale technology and R&D can be found in various reports (U.S. DOE 2007, 2011; Unconventional Fuels Task Force, 2007). Research emanating from Canadian oil sands development is also an invaluable and relevant source of information, even though focused on a different type of hydrocarbon resource.

Ex situ retort of oil shale has already been deployed commercially, however most of the richer Western oil shale resources are located at depths requiring implementing in situ retort and recovery processes. Although the technical feasibility of in situ retorting has been proved, considerable technological development and testing are still needed. Of particular note, several industry players are conducting demonstration projects as part of the Oil Shale Research Development and Demonstration Leasing Program managed by the Department of the Interior`s Bureau of Land Management (Crawford et al, 2012). Particular challenges include improving the economics of these operations by simultaneously attaining greater production efficiencies and mitigating environmental impacts.

A number of associated research topics need to be addressed in a federal oil shale R&D program, including increasing the energy return on investment, fracture mechanics and heat transfer for enhancing recovery, materials performance in high-temperature subsurface environments, real-time subsurface process monitoring, water use reduction and post-retort subsurface environmental impact mitigation. Modeling and simulation can assist in addressing many of these topics but computer simulations must be supported by laboratory testing and field validation. In addition, there is significant opportunity for developing novel technology to support ``smarter,`` environmentally-friendly oil shale development.

A number of challenges and opportunities also exist for an emergent oil shale industry as a whole. Collectively there are likely several pathways to develop Western oil shale, which goes beyond addressing individual site operations. Accordingly, it is worthy to consider conducting an oil shale industry fuels logistics analysis which would help better understand options for developing a power, refining and delivery infrastructure, within the context as well of a marketplace. Given the size and longevity of the resource, there is also opportunity to investigate application of hybrid energy systems approaches, including integrating renewable and/or nuclear energy into oil shale development schemes for achieving greater carbon efficiency and reducing environmental impact. Understanding the development of a U.S. oil shale industry within the context of a greater bi- national regional energy corridor is also essential to enhancing long-term U.S. energy security and the economy. In addition, there will be cumulative environmental and socioeconomic effects in the region that need to be better understood and addressed, including within the context of competing needs (i.e., for agriculture, municipalities, industry, etc.).

Associated with both site operations and development of a larger oil shale industry is a need to ensure that oil shale resources are developed using environmentally suitable approaches. Increasingly, research is playing a role in better understanding the interdependencies between energy development and the environment and the development of innovations that mitigate environmental impacts. This requires significant investments in research to enhance environmental performance associated with water, air quality, wildlife, land (including land reclamation) and greenhouse gases. Water management, as an example, is critical in the arid west and there are concerns that adequate quantities are available to support an oil shale industry and whether there will be impacts on water quality and use elsewhere.

COMMENTS ON DRAFT LEGISLATION TITLED ``TAPPING AMERICA`S ENERGY POTENTIAL THROUGH RESEARCH AND DEVELOPMENT ACT OF 2012.``

A federal oil shale R&D program is critical to establishing a viable U.S. oil shale industry, focused on long-term responsible and safe oil shale production. Given the evidence from R&D investments made in similar settings, such as the Canadian oil sands, an oil shale program would provide a high return on investment. A well-organized federal R&D program can provide the backbone for coordinating research across academia, industry, and state and federal laboratories.

The objective of such an oil shale R&D program should be to provide solutions that help achieve specific production and environmental performance goals. It should have a strong strategic plan and a road map to better focus and prioritize R&D investments. Prescribing specific investment R&D directions without sufficient planning can be risky and potentially lead to disconnected R&D efforts that do not effectively

achieve the desired end state. A significant body of work produced by DOE and the Task Force on Strategic Unconventional Fuels already exists upon which R&D planning can be built (see references) including a 2008 strategic plan for implementing portions of the Task Force`s recommendations (Task Force`s 2007 program plan), prepared by an Ad-Hoc group of approximately 35 representatives from private industry, academia, community representatives, and local, state and Federal agencies (DOE, 2008).
Stakeholder engagement in an R&D program is very important. Tapping diverse views and champions are essential for innovations in technology. A R&D network promoting ``shared research`` will improve technology development and have greater impact on technology development than isolated R&D.
The R&D program must consist of investments in both basic and applied research, given the nature of the industry and its longevity. In addition, a strong field demonstration aspect should be required to better facilitate technology deployment. Such a program would provide a greater understanding of the potential benefits and impacts of oil shale development, while preparing the ground work for, and facilitating, commercialization of America`s strategic oil shale resources.
The U.S. Department of Energy and its laboratories are well qualified to provide leadership to deliver a focused, solutions oriented R&D program to address key challenges in realizing a competitive U.S. oil shale industry. DOE is a technical integrator that can bring together needed assets and expertise from both within and outside DOE, including universities and industry, to provide a high-quality R&D program, and as well, act as a needed honest broker of technical information.
Chairmen and members of the Subcommittee, thank you once again for the opportunity to testify.

Rep. Ralph Hall, R-Texas
Committee: **House Science, Space and Technology Committee – Subcommittee on Energy and Environment**
Subject: U.S. Energy and R&D
Testimony:
Opening Statement of Rep. Ralph Hall, R-Texas, Chairman, Committee on House Science, Space and Technology
Committee on House Science, Space and Technology Subcommittee on Energy and Environment
November 30, 2012
Good morning and thank you Chairman Harris for yielding me time. I want to thank the witnesses for being here to talk about an issue that is very important to me. In particular, I would like to recognize and thank Dr. Daniel Hill, the Chair of Texas A&M Petroleum Engineering Department, and Mr. David Martineau, the Chairman of the Texas Independent Producers and Royalty Owners Association (TIPRO).
Energy policy is and has always been one of my top priorities, both as a Member, and as Chairman of this Committee. I believe strongly that, after prayer, energy is the most important word in the dictionary. It is the foundation upon which our nation has prospered, and the key to our quality of life and standard of living.
That is why I introduced H.R. 6603, which would increase energy security through support for research and development to enable prudent development of U.S. domestic energy resources. This legislation builds on the record of the Science, Space, and Technology Committee during my tenure as Chairman.
The U.S. is blessed with a wealth of unconventional energy resources and we are currently experiencing a revolution in oil and gas production thanks to those resources. This increased production is not only increasing our energy security, it is stimulating our economy and creating much needed jobs. In 2010, unconventional natural gas development alone supported over a million jobs in this country, and this number is expected to more than double by 2035.
This bipartisan legislation promotes the development of oil shale instead of restricting it, and ensures we maximize the benefits of our unconventional oil and gas resources. The bill directs the Department of Energy to undertake R&D activities to address the scientific and technological barriers to oil shale development. It also supports R&D to minimize water use and maximize efficiency in shale oil and gas operations. The legislation includes language from the Produced Water Utilization Act, a bill I sponsored in the 111th Congress and passed through the House with unanimous consent.
In 2005, I helped author Section 999 of the Energy Policy Act, which created a very successful Department of Energy unconventional oil and gas research and development program. The bill before us today is intended to complement the ongoing 999 program which is currently set to expire in 2014 but I hope will continue beyond that , as well as provide direction for the DOE oil shale R&D activities and the

Administration`s proposal for an interagency R&D collaboration on unconventional energy resources. The only thing that can stop this amazing story from continuing is politics specifically, the Environmental Protection Agency`s thinly veiled campaign to restrict access to these resources. The bill I`m introducing today will help to provide a check against EPA`s war on energy by addressing environmental challenges through technological solutions instead of job-killing regulations.
I would like to ask unanimous consent to enter into the record a letter from the American Geosciences Institute in support of H.R. 6603.
I look forward to hearing from our witnesses today, and I yield back.

Rep. Andy Harris, R-Md., subcommittee chairman, opening statement
Committee: H**ouse Science, Space and Technology Committee -- Subcommittee on Energy and Environment**
Subject: U.S. Energy and R&D
Testimony:
Opening Statement of Rep. Andy Harris, R-Md., Chairman, Subcommittee on Energy and Environment Committee on House Science, Space and Technology Subcommittee on Energy and Environment November 30, 2012
Good morning and welcome to this morning`s hearing entitled Tapping America`s Energy Potential Through Research and Development.
Let me begin by noting that this is expected to be the last Energy and Environment Subcommittee hearing of this Congress. I would like to thank Ranking Member Miller and the Members of the Subcommittee for working together to consider and address issues of great importance to the future of our country.
As we have highlighted throughout this Congress, the United States has a wealth of untapped unconventional energy resources. The International Energy Agency recently predicted the U.S. will overtake Saudi Arabia to become the world`s largest oil producer by 2020, largely due to the potential for development of U.S. unconventional energy resources. The significant positive economic benefits associated with development of unconventional energy resources are widely acknowledged.
Tapping America`s unconventional oil and gas resources will additionally provide sorely needed stimulation of our economy, restore our manufacturing sector and create high-paying middle class jobs. Citigroup predicts the cumulative impact of new oil and gas production could create as many as 3.6 million new jobs by 2020. Unfortunately, the degree to which the U.S. will pursue and realize these benefits remains in doubt, primarily due to politics.
Under Chairman Hall`s leadership, the Science, Space, and Technology Committee and this subcommittee in particular has explored a broad range of energy production-related issues, from the lack of transparency and weak scientific foundations underlying EPA`s job-killing regulations to the waste and imbalance in Department of Energy`s research and development activities. Unfortunately, time and again, a massive disconnect between the President`s words and his Administration`s actions are evident.
While President Obama continues to claim he supports an ``all-of- the-above`` energy strategy, the plain facts tell a different story. This was clearly illustrated in May when DOE`s Assistant Secretary for Fossil Energy testified to the subcommittee that oil shale was a component of the Administration`s all-of-the-above energy strategy. Yet when pressed, he acknowledged DOE was not spending any funding on oil shale R&D, and could not identify anything the Administration was doing to actively advance oil shale. In fact, despite the President`s prominent call for an all of the above energy strategy in this year`s State of the Union speech, just recently the Obama Administration finalized a plan effectively reducing lands available for oil shale production by two thirds.
Unfortunately, the Administration`s rhetoric on energy production is similarly empty when it comes to shale gas and hydraulic fracturing, where the EPA is leading 13 Federal agencies and offices in pursuit of new ways to regulate this incredibly beneficial and safe technology. Chairman Hall`s legislation, the ``Tapping America`s Energy Potential Through Research and Development Act of 2012,`` addresses the obvious imbalance in DOE research priorities. It restores a true all-of-the-above R&D focus at DOE through authorization of limited and targeted research and development activities that develop key technologies relating to oil shale, shale oil and gas, and produced water utilization.

Dan Hill, Head professor & Noble chair, Texas A&M University
Committee: **House Science, Space and Technology Committee -- Subcommittee on Energy and**

Environment
Subject: U.S. Energy and R&D
Testimony:
Statement of Dan Hill, Head Professor & Noble Chair, Petroleum Engineering, Texas A&M University
Committee on House Science, Space and Technology Subcommittee on Energy and Environment
November 30, 2012
Good Morning. I am Dan Hill and I am the Head of the Petroleum Engineering Department at Texas A&M University. I have been a faculty member for over 30 years after working in industry for about 5 years, and throughout my career I have conducted research on methods to improve oil and gas production. For the past ten years, I have been supervising research projects funded by the Department of Energy studying horizontal wells and hydraulic fracturing.
Unconventional oil and gas production has changed the U. S. energy game.
In just a few years, applications of advanced technology have led to the most dramatic economic boost our country has seen in my lifetime. Production of natural gas and oil from unconventional reservoirs, primarily shale formations, is soaring, daily lessening this country`s dependence on imported oil. Slide 1 is a history and forecast of the U. S. natural gas supply - in less than 10 years, gas production from shale formations has grown to over 30% of the U. S. supply, and continues to grow. This is great news in every possible way - natural gas is the cleanest burning fossil fuel, it yields the least CO2, and it is low cost, thanks to its newfound abundance in unconventional reservoirs.
Even more dramatic is the rapid increase in domestic oil production from unconventional reservoirs. Slide 2 shows that oil production from the Bakken formation in North Dakota is now close to 500,000 barrels per day. Forecasts are that Bakken production will reach a peak of 1 - 2 million bpd - equivalent to peak production from the Alaskan North Slope. Production from the Eagle Ford formation in South Texas has grown from about 800 bpd to almost 300,000 bpd in only 3 years (Slide 3). These are just two examples. There are many other unconventional reservoirs in other parts of the country that are also rapidly adding to domestic production. Without question, there is a revolutionary change in U. S. energy supply underway, solely due to oil and gas production from unconventional reservoirs.
How did this happen?
This shale production revolution is a result of major advances in the technologies of horizontal drilling and hydraulic fracturing, and, in particular, the combination of these two technologies. These advances have been aided greatly by a modest level of research funding from the Department of Energy, funding that supported research primarily at universities, small businesses, and the national laboratories.
Let me give you one example. Beginning in the early 80`s and through the mid-90`s, the Department of Energy, along with the Gas Research Institute, supported fundamental research on measuring the sounds made as hydraulic fractures are created. This research, led by a team at Sandia National Laboratory, resulted in a commercial technique for mapping hydraulic fractures that is now called microseismic monitoring. This technique, which has now been applied to tens of thousands of fracture treatments, and which is now itself a multi-million dollar industry, has allowed engineers to greatly improve hydraulic fracturing and well completion practices by providing a means to measure the extent of the fractured region. Slide 4 shows a microseismic map of the area affected by a multi-stage fracturing operation.
The development of microseismic monitoring of hydraulic fracture treatments was clearly enabled by the Department of Energy funded research that proved its viability. This basic research was greatly aided by research funding by GRI and the U.S. Department of Energy.
Is the current domestic energy growth sustainable?
The goal of energy security, and possibly energy independence for the United States is no longer just political rhetoric, but is technically attainable.
We know where the resources can be found, but we still need technical improvements to be able to produce much of the resource at prices that are beneficial to the public. However, it will not be easy, and it will require two things - further developments in technology, and the trained engineers and geoscientists needed for continued growth. The proposed Department of Energy research funding will be a great help with both of these needs.
On the technology side, although hydraulic fracturing methodologies have obviously been developed to the point that oil and gas are economically recoverable from very low permeability unconventional reservoirs, there is still a great deal of improvement that can be made to this technology. One of the major challenges is the development of various ways to lessen the environmental impacts of hydraulic fracturing operations, including using less fresh water in the process, and drilling fewer wells to contact the same amount of reservoir. Another challenge is the development of lower cost hydraulic fracturing techniques.

Ironically, the success of the industry in rapidly developing huge new volumes of natural gas from shales has led to a low gas price, which has slowed gas drilling markedly.
If the rapidly increasing oil production has a similar effect, unconventional oil development will inevitably slow down, unless lower cost methods can be applied to achieve the same results. The Department of Energy has been funding fundamental research in conjunction with the Research Partnership to Secure Energy for America (RPSEA) on topics like these for the past several years, and this research is having a visible impact on industry practices. It is important to continue supporting RPSEA as they have a proven track record of producing important research results using a unique public - private partnership model.
Perhaps most important is the role that Department of Energy funding for unconventional oil and gas research will have on the training of the engineers and scientists needed to sustain growth in unconventional oil and gas development. The research funded by DOE occurs primarily in universities and most of the money ends up in the pockets of graduate students in the form of research assistantships. The demand for engineers in this field is huge - the COO of a major service company recently told me that his company alone hired 15,000 new employees in the U. S. in 2011.
That is a lot of jobs, and many of them need to be highly trained engineers and scientists. Because of this booming demand for petroleum engineers to work in unconventional oil and gas development, we are receiving unprecedented demand for places in our graduate program. Other universities with graduate programs in Petroleum Engineering are also receiving numerous applications for graduate school. To attract and retain high quality graduate students, a university has to offer financial aid, and this is usually in the form of a research assistantship funded by an external grant.
The research funding provided to universities through the proposed Department of Energy research program will help support the graduate students who will become the future technology leaders of our country.

David Martineau, chairman, Texas Independent Producers and Royalty Owners Association
Committee: **House Science, Space and Technology Committee — Subcommittee on Energy and Environment**
Subject: U.S. Energy and R&D
Testimony:
Statement of David Martineau, Chairman, Texas Independent Producers and Royalty Owners Association
Committee on House Science, Space and Technology Subcommittee on Energy and Environment
November 30, 2012
Good morning Mr. Chairman and members. My name is David Martineau, and I am here representing the Texas Independent Producers and Royalty Owners Association, also known as TIPRO.
TIPRO was founded in the East Texas Field in 1946. Since then, TIPRO has grown into a top tier oil and natural gas trade association, made up of over 2,500 members statewide. Our membership ranges from small, family-owned businesses to the largest publicly traded independent producers, and includes large and small royalty owners, mineral estates, and trusts.
I currently have the pleasure of serving as the Chairman of the Board of Directors for TIPRO. I am a Certified Petroleum Geologist, a licensed Texas Professional Geoscientist, and I work as exploration manager for Pitts Oil Company based out of Dallas, Texas. I am truly honored to have the opportunity to address you all today.
Lately, much has been made of this country`s looming ``fiscal cliff``. The United States, however, is not only facing a fiscal cliff, but an ``energy cliff`` as well. Domestic independent producers are responsible for approximately 75% of domestic natural gas production, and nearly 50% of domestic oil production. However, threats to the framework that allows independents to maintain and grow these production levels exist in various forms:
1) Tax provisions like Intangible Drilling Cost deductions (IDC`s) and depletion allowance that are crucial to the survival of small independent producers are being attacked and mislabeled as ``big oil subsidies``.
2) Overreaching regulations from the EPA and U.S. Fish and Wildlife Service with little to no scientific backing pile additional unnecessary compliance costs onto the oil and natural gas producers.
3) The federal government is attempting to go green and ``pick winners`` by focusing federal research and development monies on unproven, uneconomical, and unreliable energy sources. They will not face the fact that eighty-five percent of the energy in the U.S. comes from fossil fuels.
What needs to be done to continue to tap America`s Energy Potential that has been created by the new Shale Revolution?

1) Understand variations in subsurface properties to avoid drilling marginal wells and increase recovery efficiency.
2) Scientifically characterize risks and inform stakeholders.
3) Minimize surface impacts of unconventional oil and gas operations.
In the past, federal dollars have been spent on researching and developing improved methods of oil and natural gas extraction. Much of the resultant data and techniques, combined with the forward thinking of some brilliant and creative private sector minds, resulted in some of the biggest energy successes in the country`s history. A few specific cases of worthwhile federal research conducted on oil and natural gas development:
-- In 1976 - the U.S. Department of Energy initiated the Eastern Gas Shales Project to evaluate the gas potential of, and to enhance gas production from shales within the Appalacian, Illinois, and Michigan basins in the eastern U.S. This project showed that we had enormous amounts of natural gas locked in these domestic shale formations, which are now the massive Marcellus and Utica plays.
-- In 1982 - the federal government began funding the research efforts of the Gas Research Institute - an industry-formed research and development program, founded in 1978, which has since resulted in increased natural gas viability as a fuel source.
-- In 1991 - George P. Mitchell, with financial help from the Department of Energy, drilled and completed his first Barnett Shale horizontal well.
-- In 2005 - Energy Policy Act - is a research program with the Research Partnership to Secure Energy for America (RPSEA).
Recognizing the importance of oil and natural gas, and investing federal money in its development, should not be a thing of the past. In fact, never in history has it been more crucial to continue improving and enhancing our ability to recover domestic oil and natural gas. Domestic energy independence can be achieved, and federal research money can play a part.
In the state of Texas alone, since the Shale Revolution started from 2006 to 2011 we have increased annual production of oil from 347 million bbls to 431 million bbls and natural gas 6.3 trillion MCF to 7.7 trillion MCF. This partially is why our imports have dropped from 70% to 45% in that same time period and we are headed toward energy independence.
Chairman Hall`s H.R. 6603 is a good step in the right direction and I compliment him on his efforts. Many areas where additional research could produce significant results are outlined in the bill, including:
-- hydraulic fracturing -- development of improved proppants -- water minimization, management, re-use, and alternatives --improved modeling of formations -- energy efficiency in exploration and production
Hydraulic Fracturing
The hydraulic fracturing process, as it has evolved over the past 50+years from vertical wells to long horizontal wells with multiple fracture treatments has introduced many complexities.
There is a need for research focus in this area to increase recovery efficiency. To do so requires research focusing on the subsurface processes involved with fracturing, including modeling of the process, microseismic assessment, emissions, water usage and other research. Successful research will increase the efficiency of the process, significantly reducing the number of wellbores required, resulting in a reduction in well sites, water usage, emissions, traffic, noise, dust and other factors, all while increasing oil and gas recovery per well. This area of research, the optics of which do not indicate direct environmental impact, can have an overwhelming environmental impact.
Water Management
According to data collected by the Texas Water Development Board, the volume of water used in hydraulic fracturing represents less than 1% of all water consumed in the state of Texas.
However, water management goes hand-in-hand with the hydraulic fracturing process, and industry recognizes that there is still progress that can be made in this arena. Research and development are needed to address:
1) mitigation of the volumes of fresh water required for hydraulic fracturing; 2) significant volumes of water produced from oil and gas shale wells and associated concerns as to its composition; 3) the development of technology to process water - converting the industry`s largest waste stream into a new, useful product; and 4) assuring the ability to safely dispose of water in the subsurface by geologic characterization of potential disposal zones which vary across the country - geologic basin to geologic basin.
Understanding the Subsurface
The subsurface geologic conditions and types of resource rock found within unconventional gas formations, in particular oil and gas shale, require ongoing research. Flow of fluids (gas, oil, water) through very low permeability formations (particularly oil and gas shales) is not well understood. By

increasing our understanding of subsurface geologic conditions, we can make progress toward effectively answering questions regarding economic recovery and environmental safety.
Additionally, subsurface research can increase recovery efficiency from many unconventional oil and gas fields in the U.S., further unlocking minerals yet in place. These developed fields each have an entire infrastructure already in place, i.e. roads, wellbores, metering facilities, marketing, etc.
Thousands of small independents, many of whom are TIPRO members, do not have the resources to conduct their own research, yet cumulatively produce a huge portion of domestic oil and natural gas. This is an area where targeted and carefully disseminated federally-funded research efforts can have a significant and immediate impact on production and the economy, and I urge you to revive federal research investments into this worthwhile industry.
Often efforts intended to impact major, global oil and natural gas companies end up having a much larger impact on small, family- owned companies, many of whom live and work in your hometowns. These companies are a giant component in generating American jobs and resources for your state and this country, and they are worthy of your investment.
Thank you again for the opportunity to address you today.

Source: CQ Transcriptions

Abraxas reports progress on wells in Eagle Ford Shale
San Antonio Business Journal by Mike W. Thomas, Reporter
Date: Tuesday, November 27, 2012, 6:39am CST
Mike W. ThomasReporter- San Antonio Business Journal

Abraxas Petroleum Corp. is reporting positive results with its wells in North Dakota and South Texas. The Company successfully completed its Cobra B 1H well in McMullen County with a 19 stage fracture stimulation on Nov. 24.

“We remain enthused with the productivity of the wells we continue to bring on,” says Bob Watson, president and CEO of San Antonio-based Abraxas. “Our operations in North Dakota and in the Eagle Ford continue to run efficiently with drilling times and costs continuing to come down.”

Abraxas will be presenting at the Dahlman Rose & Co. Ultimate Oil Service and E&P Conference in New York on Dec. 3 and at the Capital One Southcoast Energy Conference on Dec, 4, 2012.

Abraxas (NASDAQ: AXAS) is a crude oil and natural gas exploration and production company with operations across the Rocky Mountain, Mid-Continent, Permian Basin and onshore Gulf Coast regions of the United States and in the province of Alberta, Canada.

BNN FRONTRUNNER
Washington News
Nov. 27, 2012
Oil And Gas Boom Boosts Wealth In Small Towns
Nov. 27, 2012 – USA Today (11/27, Cauchon, Overberg, 1.71M) reports, "The nation's oil and gas boom is driving up income so fast in a few hundred small towns and rural areas that it's shifting prosperity to the nation's heartland." USA Today adds that while "average income per person fell 3.5% in metropolitan areas between 2007 and 2011 after adjusting for inflation...inflation-adjusted income is up 3.8% per person since 2007 for the 51 million in small cities, towns and rural areas."

Actors, Musicians Protest Fracking.

The Washington Times (11/27, Wolfgang, 76K) reports that fracking has already become "the focus of major films, rock 'n' roll songs and late-night monologues," in part because critics "think greater public

awareness helps their cause." One such effort is the "upcoming Matt Damon movie "Promised Land," which tells the tale of small American towns ruined by fracking." Efforts have also targeted New York Gov. Andrew Cuomo, a Democrat, who "has for months delayed a final decision, but...is still considering a plan that would allow oil and gas companies to drill in portions of New York near the Pennsylvania border."

Source: BNN Frontrunner

Cooper basin well cuts thick unconventional gas pay

Oil & Gas Journal 11/29/2012
http://www.ogj.com/articles/2012/11/cooper-basin-well-cuts-thick-unconventional-gas-pay.html?cmpid=EnIEDNovember292012
Senex Energy Ltd., Brisbane, said its Kingston Rule-1 unconventional gas exploratory well in Australia's southern Cooper basin encountered 53 m of net gas pay in tight sands and 170 m of shale and coal in various formations in the Early Permian section.

Title: **Remotely reconfigurable system for mapping subsurface geological anomalies**
Document Type and Number: United States Patent 8321160
http://www.freepatentsonline.com/8321160.html
Abstract: A method and apparatus are provided for detecting and transmitting geophysical data from a plurality of electrodes inserted into the soil utilizing a set of identical dynamically reconfigurable voltage control units located on each electrode and connected together by a communications and power cable. A test sequence is provided in each voltage control unit. Each voltage control unit records data measurements for transmission to a central data collector. Each voltage control unit incorporates and determines its positional relationship to other voltage control units by logging when the unit is attached to the electrode. Each voltage control unit I equipped with a magnetic switch for detecting when they are in contact with the electrode.
Inventors: Bryant, John (Carollton, TX, US)
Willey, Michael H. (Garland, TX, US)
Lehmann, Guenter H. (Sachse, TX, US)
Salamat, Arash Tom (Plano, TX, US)
Edgar, Michael (McKinney, TX, US)
Leopold, Jerry (Richardson, TX, US)
Application Number: 12/587953
Publication Date: 11/27/2012
Filing Date: 10/15/2009

Title: **Method of delivering frac fluid and addivities**
Document Type and Number: United States Patent 8316935
http://www.freepatentsonline.com/8316935.html
Abstract: A method for the controlled delivery of a fracturing fluid to a well bore comprises formulating an aqueous base fluid such that it meets or exhibits desired physical and chemical characteristics for an optimal fracturing fluid. The formulation of the aqueous base fluid max involve commingling one or more sources of waste water with a source of fresh water followed by controlled injection of one or more additives. This process is substantially completed prior to delivering the aqueous base fluid to the well site. This allows the delivery of an optimal volume of the aqueous base fluid with homogeneously blended additives to the well bore.
Inventors: Termine, Enrico J. (The Woodlands, TX, US)
Richie, Robert I. (Conroe, TX, US)
Application Number: 13/453210
Publication Date: 11/27/2012
Filing Date: 04/23/2012

Title: **Rod-shaped proppants and anti-flowback additives, methods of manufacturing, and methods of use**
European Patent Application EP2500395 Kind Code: A2
http://www.freepatentsonline.com/EP2500395.html
Abstract: A sintered rod-shaped proppant and anti-flowback agent possesses high strength and high conductivity. The sintered rods comprise between about 0.2% by weight and about 4% by weight

aluminum titanate. In some embodiments, the sintered rods are made by mixing bauxitic and non-bauxitic sources of alumina that may also contain several so-called impurities (such as TiO2), extruding the mixture, and sintering it. The starting material may optionally be milled to achieve better compacity and crush resistance in the final sintered rod. A fracturing fluid may comprise the sintered rods alone or in combination with a proppant, preferably a proppant of a different shape.
Inventors: Alary, Jean Adre (90 Chemin de la Carichone, 84800 L'Isle sur la Sorgue, FR)
Parias, Thomas (390 Forest valley Court NE, Atlanta Georgia 30342-2353, US)
Application Number: EP20120156169
Publication Date: 09/19/2012
Filing Date: 08/30/2007

Fracking news: F**racking mines spread quickly in U .S. / Fracking by country data included** [Dan Vergano, Russel Mc Lendon, Wikipedia]
http://savethewater.org/2012/06/fracking-news-fracking-mines-spread-quickly-in-u-s-fracking-by-country-data-included-dan-vergano-russel-mc-lendon-wikipedia/

Pennsylvania: Seneca gauges Forest County Utica well
Oil & Gas Journal 11/29/2012
http://www.ogj.com/articles/2012/11/pennsylvania-seneca-gauges-forest-county-utica-well.html?cmpid=EnlDailyNovember292012&hq_e=el&hq_m=24682&hq_l=148&hq_v=z93aae0e00
National Fuel Gas Co.'s Seneca Resources Corp. unit has flow-tested its first horizontal Utica shale well, in Forest County, southeast of Titusville, Pa.

Athabasca Oil Corp. reports strong Duvernay results
Oil & Gas Journal 11/28/2012
http://www.ogj.com/articles/2012/11/athabasca-oil-corp-reports-strong-duvernay-results.html?cmpid=EnlDailyNovember292012&hq_e=el&hq_m=24682&hq_l=153&hq_v=z93aae0e00
Athabasca Oil Corp. reported strong test results in the Duvernay shale play in west-central Alberta, and AOC said a better understanding of the shale's fracture characteristics has enabled the company to evolve its hydraulic fracturing techniques.

MarkWest, Gulfport gear up Utica shale operations
Oil & Gas Journal 11/27/2012
http://www.ogj.com/articles/2012/11/markwest-gulfport-gear-up-utica-shale-operations.html?cmpid=EnlEDNovember292012
MarkWest Utica EMG LLC has started up the 60 MMcfd Cadiz refrigeration plant in Harrison County, Ohio, supported by production from two Utica shale wells operated by Gulfport Energy Corp., Oklahoma City.

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http://www.surveymonkey.com/s/epalibsurvey

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"Strive not to be a success but rather of value." Albert Einstein